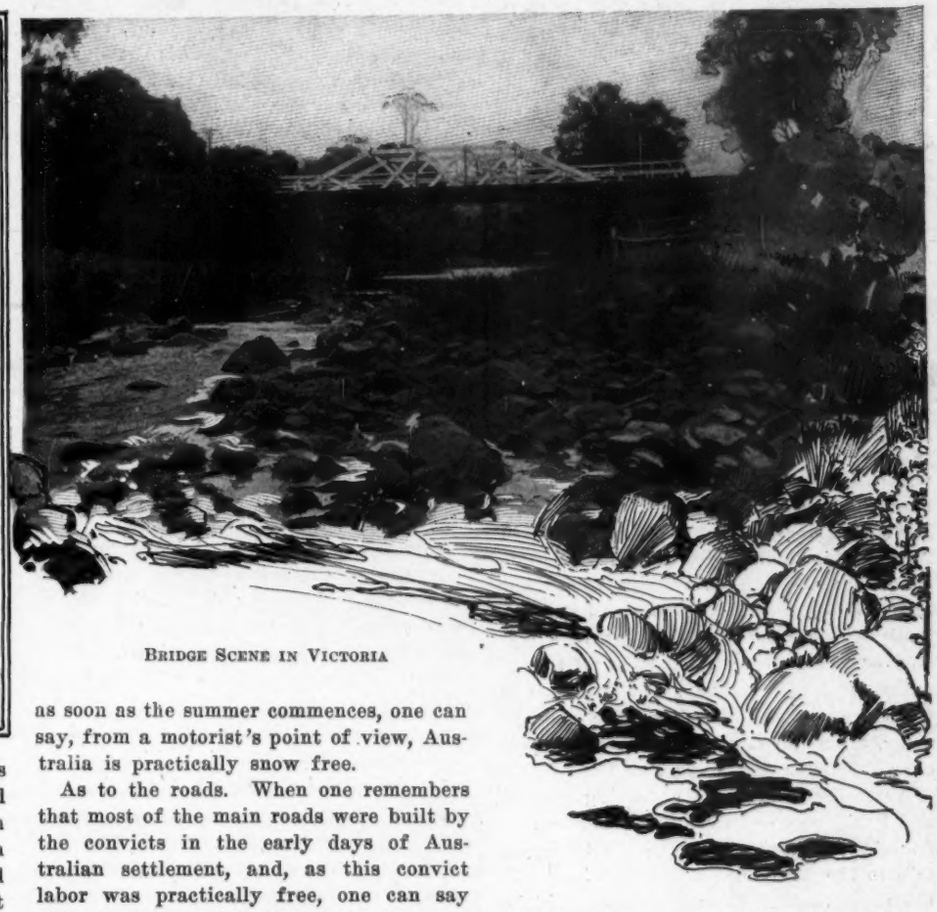
VOL. XIII No. 14 CHICAGO, APRIL 2, 1908 $3.00 PER YEAR

MOTOR AGE

AUSTRALIA OFFERS MOTORING INDUCEMENTS

Antipodean Australia with its maximum width east and west of 2,500 miles and measuring 1,900 miles from its northern to its southern shores offers good inducements to motorists with its convict-built roads in the southeastern quarter of the continent, which is the only section settled, the vast north, central and western sections being largely semi-arid areas. In addition to the thousands of miles of improved macadam highways that unite such population centers as Sydney, Melbourne, Brisbane and Adelaide is a network of semi-improved intersecting roads supplemented by trails connecting with the several hundreds of large grazing ranches scattered over the foothills of the Australian Alps. With this road situation and a climate very equable the year round—with snow scarcely known—and where nature has been most delicate in fashioning its rarest pastoral landscapes or rearing its rugged mountain fastnesses, the world-girdling motorists can find much to interest them in a month or 6 weeks' tour.



BRIDGE SCENE IN VICTORIA

AUSTRALIA, its climate and roads, its clubs and competitions, the cars used there, and its touring facilities, all form a subject on which little has been written in the motor journals of America, England and the continent. The average motorist and the manufacturer know little or nothing concerning one of the best motoring countries on the face of the globe. The reason Australia has such great possibilities for the motorist and offers such inducements to the motor tourist is, firstly, the climate is ideal, and, secondly, the roads and scenery are entirely satisfactory.

Now both America and England have an off season, when even the most ardent motorist can scarcely persuade himself to venture out, and even if he does do so the ride cannot be called enjoyable. Australia has no such season; motoring is quite enjoyable all the year round. True, snow does fall in the Australian Alps, and several of the inland mountains in the south of the continent, yet there is so little of it, and, as most of this snow disappears as soon as the summer commences, one can say, from a motorist's point of view, Australia is practically snow free.

As to the roads. When one remembers that most of the main roads were built by the convicts in the early days of Australian settlement, and, as this convict labor was practically free, one can say with truthfulness that these main roads were well made. Most everyone knows how men were dumped out to Australia for the most trivial crimes in England, how these men were made to work in gangs. Many of these gangs were put on building roads, etc., and the consequence is that hard, well-made thoroughfares were constructed through all the principal parts of the country, opening up large tracts of land and connecting all the state capitals. This was in the days before railways made their appearance, and a good road meant everything to those concerned. This dumping of men into Australia ceased years and years ago. At the present time the governments of the different states keep all the main roads and also that vast network of roads, which connect inland towns or villages with the main road, in good repair. Large ranches are in most cases connected to one another by tracks, which are not specially "built up" as roads are, but consist of a center track in which the horse trots and a gutter on either side made by the vehicle wheels; the American runabout here has the advantage of the English and French, for the American tracks and the others do not. These tracks are laid down anywhere across a field and are sandy in places. Later on the type of car needed by the average Australian "cocky" or small farmer, as an everyday vehicle to displace his horse and buggy will be touched upon. Generally speaking New South Wales is more hilly than either Victoria or South Australia, but, as

Editor's Note—This article is written by Roy Sandford, late of Lithgow, New South Wales, and will be concluded next week.

CLIMBING MT. VICTORIA PASS

one cannot call Australia a mountainous country, these hills form no obstacle to the present-day motor car, but rather add zest to the tour, as some of the most beautiful and most unique scenery in the world is found in the Australian mountains and within easy reach of the fortunate owner of a motor car.

Another reason for the good roads in Australia is the scarcity of railways. Victoria is much more fortunate than New South Wales, South Australia and Queensland in this respect. Thus, where a station or ranch owner lives from 40 to 150 miles from the railway, and where stations are perhaps 40 miles from one another, the motor car has a tremendous pull over the horse and buggy.

Australia is ideal as a touring ground and I will now endeavor to set before any American motorist who intends taking a trip to the Antipodes a little advice as to the route to take when he arrives. If he intends to get off at Brisbane and tour south to Sydney, he will have a tough task. The writer has known motorists who have made this trip and others who have started to do it and they are unanimous in declaring that, although the scenery is perfect among the coastal rivers, yet the roads are so bad and the crossing of these rivers so difficult, on account of no bridges, that their advice to motorists intending to undertake this trip is—don't do it.

From Brisbane runs can be taken to Ipswich, Twowoomba and Warick; all which towns are within 200 to 300 miles of Brisbane. A beautiful road extends to Sandgate, a short distance up the coast from Brisbane. The best advice is either not to ship the car to Brisbane at all, or else visit the towns named from Brisbane, again shipping and so landing at Sydney.

Sydney, the oldest town in Australia, has a population of about 600,000 and is built on the best harbor in the world, besides possessing an excellent ferry and electric car system, which fact largely kills the use of the business man's motor car. Nature certainly was in a good mood when she fashioned Sydney; a motorist could spend a full week and not go 30 miles from the city and even then he would not have seen all the beauty spots—charming river drives, coast drives, drives through the orange groves of Pennant hills and Penrith. Just a word of warning here. The Australian road law is keep to the left, directly opposite to the American system. After having seen the city and the beauty spots in the vicinity, the motorist starts inland to the Blue mountains—the summer and health resort of Sydney. As far as Penrith, 30 miles, it is fairly flat country; then the road rises sharply into the famous Lapstone hill; the steepest grade being about 1 in 7. After this the road slowly rises until Katoomba is reached; here may be seen thousands of small cottages, dotted among the hills, showing how extensively the Sydneyite comes to the mountains for summer. The road right up the mountains is good all the year round and the scenery superb. Medlow Bath, a little further on than Katoomba, is the sanatorium of New South Wales; built by Mark Foy, one of Sydney's importers; it overlooks the famous Kanimbla valley and has every facility for making the tourist comfortable. There a garage has been erected in conjunction with the sanatorium and as a large fleet of motors is kept for daily trips to the world-renowned Jenolan caves, the motorist can get everything he wishes. From here trips can be made to a hundred and one different sights. Leaving Katoomba he passes on to the Mount Victoria hill, where the grades touch 1 in 6. Lithgow, the great industrial center of Australia, can

VIEW OF AUSTRALIAN ALPS

be seen, and from here an excellent road and good scenery takes one to Mudgee, about 180 miles from Sydney. From here to Wellington is a fine ride and on to Dubbo, where the Royal hotel will accommodate the tourists. The return trip through Wellington, Orange and Bathurst gives one an extremely good idea of the farming industry. If the motorist wishes to see large stations he must go farther west, where are stations whose wheat crop covers from 15,000 to 20,000 acres and which shear from 130,000 to 200,000 sheep per season. Bathurst, the largest town on the west, is essentially agricultural. From here the motorist takes the Oberon road to Jenolan caves, which the tourist must see, as no stranger ever leaves Australia without seeing these wonders. At these caves the tourist will thoroughly enjoy himself. Imagine a large modern hotel with its flower gardens, coach drive, etc., situated in a small valley just large enough to hold it, surrounded by mountains towering above all round it. You wonder how you get to the hotel and you find that the road travels through a natural tunnel through the very base of the mountain. In this tunnel is the entrance to all the caves. These caves are perhaps different

ONE OF THE MANY WATER LANDSCAPES OF AUSTRALIA

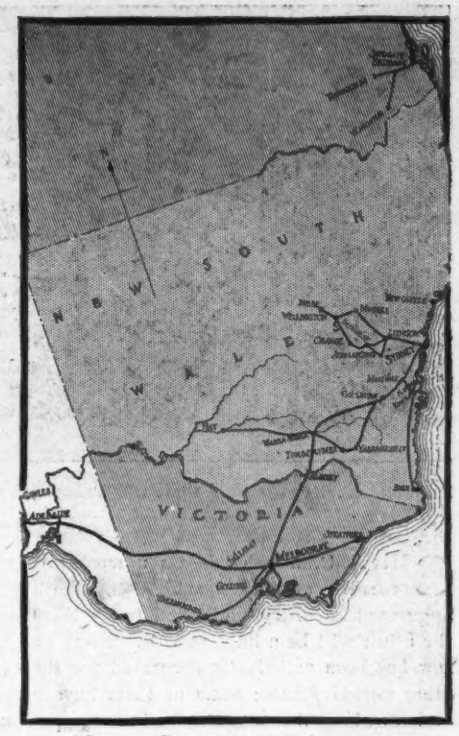
AUSTRALIA'S CONVICT-BUILT ROADS

from anything else in the world insomuch as they are mostly long passages traveling for miles through the earth and all about these passages are millions of clusters of stalactites and stalagmites. These passages are all thoroughly lit by electric light and branch out in every direction for miles. Here and there a cave will be found over 100 feet high and 150 feet long. Every conceivable color can be found in these limestone formations, which look magnificent with the electric light throwing them into bold relief. Needless to say these Jenolan caves are a regular goal for motorists and a week can be comfortably spent in seeing them. An excellent road brings one back to Medlow Bath and then on to Sydney. This round trip covers about 600 miles and a motorist must take it else he misses one-third of the pleasure of his tour.

As to hotels, the following are good: On the mountains, Medlow Bath; at Lithgow, Hunns; at Dubbo, Royal; at Bathurst, Cockbains. In Sydney there is the Australia, the Metropole, the Wentworth and many others; the three mentioned can be recommended. There are many garages in Sydney; the General Motor Co. will provide good stabling for the car and do any repair work.

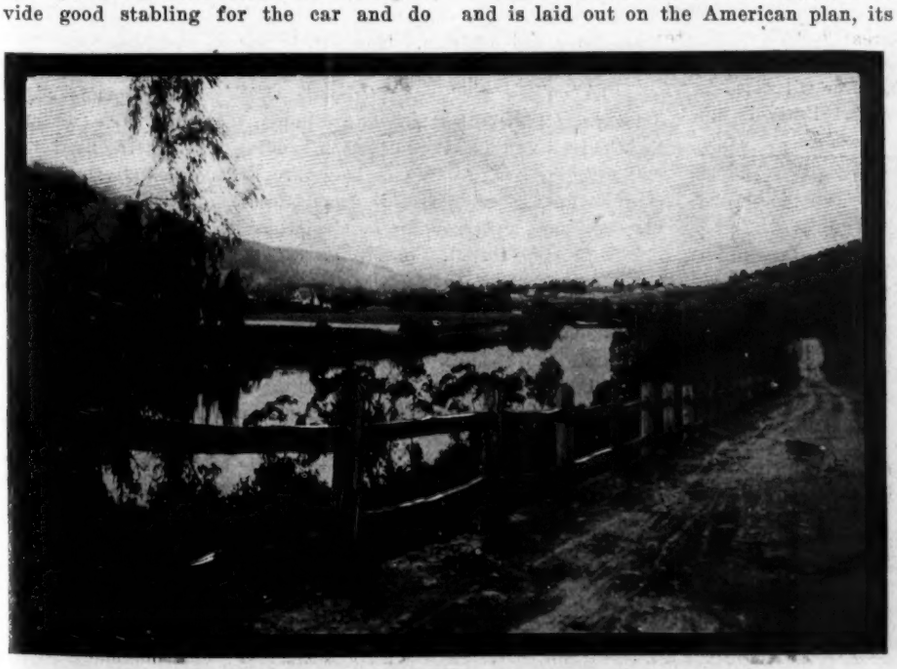
The next tour is south along the picturesque cliffs of the coast. A delightful day can be spent between Sydney, Clifton, Bulli, Kiama and Nowra, where the Prince of Wales hotel will provide any comfort. By the way, speaking of hotels, the best in Sydney will charge up to $3 per day, American plan, and most of the inland hotels charge from $2 to $2.50 per day for bed, meals and all comforts. From Nowra the tour can be continued down the coast to Eden, 350 miles from Sydney, and return to Nowra, and then inland by way of Kambewarra mountain, Kangaroo valley, Barrengarry mountain and on to Moss Vale, from which point the great southern road can be followed right into Melbourne. The tourist can deviate from this plan in two or three places—he can leave the main road and go to Tumberumba and the Yarrangobilly caves and on to join the main road at Waggawagga, from which point he could strike west to Yass and see some of the famous Riverina grazing and pastoral country. From Wagga to Albury, the border town, the road may not be equal to that between Wagga and Sydney, but as an instance that the road between Melbourne and Sydney is equal to anything in the world can be cited the case of Kellow and James, who drove a Clement-Talbot car over the 580 miles in 25 hours, only 5 hours longer than the train takes. These men lost the road for close on 5 hours, their actual driving time being a little more than 20 hours. From Albury to Melbourne the tourist will thoroughly enjoy himself, and as there are few hills, almost any speed can be touched. At Melbourne there are many hotels—the Grand and Menzies being satisfactory hostelries. Garages can be found in Exhibition street on either side of Bourke street and near this motoring district.

Melbourne is situated on the Yarra river and is laid out on the American plan, its



MAP OF SOUTHEASTERN AUSTRALIA

clean, wide, well laid out streets being both a credit to Australia and a paradise to the motorist. A Chicagoan would think himself in heaven after the cobblestones of his great city. Melbourne can rightly be called the home of motoring in Australia. Certainly it has no harbor like Sydney and has not one-quarter the number of beauty spots for the sightseer Sydney has, yet the excellence of its roads, and the width of its streets are ideal for motoring. Besides this it is the connecting link on the route between Adelaide and Sydney and it sends forth a number of excellent flat roads in a dozen different directions into the country—Bendigo and Ballarat, the great mining centers, can be visited, the former being about 170 miles from Melbourne and the latter 130. At Bendigo the tourist will find the City Family hotel up to his expectations and at Ballarat, Leister's is fine. Certainly the tourist should see Ballarat, a pretty town of some 50,000 population, possessing a beautiful lake in its midst, to say nothing of the gardens, statuary, etc. Ballarat also is on the route to Adelaide. The motorist will find that in Victoria he will seldom have to drop from his high gear. The country and roads favor the motor car. A fine tour can be taken to Geelong and on to Warnambool, on the southern coast, this road, like the others, being all that can be desired. St. Kilda beach and esplanade near Melbourne is the great bathing resort, and also is a favorite haunt of Sunday afternoon motorists. From Melbourne also a fast turbine steamer will take the tourist and his car over to Tasmania in 12 hours from heads to heads. The car is slung ashore again at Launceston, where another small world is opened up to the motorist.



A TYPICAL RURAL ROAD IN TASMANIA

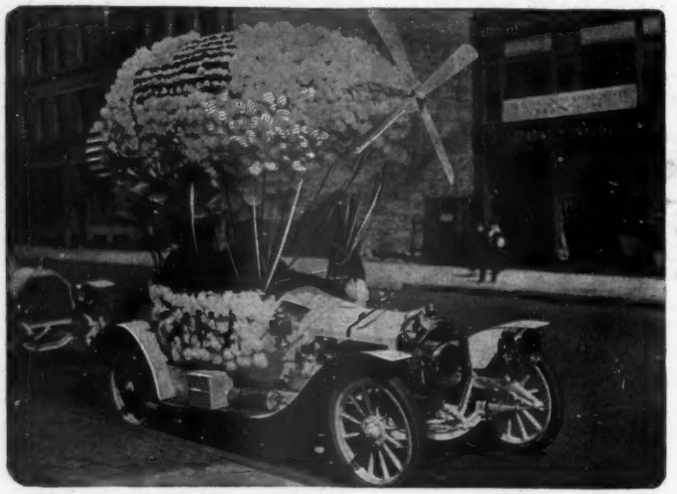
Chicago Holds its Spring Carnival

REMARKABLE PHOTOGRAPH SHOWING PROGRESS OF CHICAGO'S ILLUMINATED PARADE ALONG MICHIGAN AVENUE—STREAKS OF LIGHT SHOWING ON THE PAVEMENT ARE THE MOVING MOTOR CARS

CHICAGO, March 30—On a most pretentious scale the spring carnival of the Chicago Automobile Trade Association was inaugurated Saturday night and today there is every indication that the affair will be a huge success. Every one of the stores along the row has been artistically decorated for the occasion with ferns and other potted plants; some of them have added outside decorations and all along the street there is a carnival spirit that cannot help but enthuse dealers as well as prospective customers. In fact, every one of the sixty and more members of the trade association has entered into the spirit of the affair and with their shoulders to the wheel they are pushing with a unanimity that cannot help but bring success. In some of the places there are models new to Chicago brought on for the occasion. For instance, the Locomobile people have the special roadster which was one of the features of the Boston show. The Rambler branch has a device for photographing the actual horsepower and other mechanical features of the cars.

A census taken of the row Saturday shows there are fifty-two representatives of car concerns participating, while there are thirteen tire concerns and eleven houses handling accessories. This, it is calculated, means the carnival is a million dollar show, for the total list of the 216 different models on view reaches $900,000, while the tire and accessory exhibits easily add the other $100,000. This census also disclosed the fact that there are seventy-six different makes of cars on exhibition, of which number all are American-made except two, the Renault and Isotta. In this lot are several motor buggies and commercial propositions, while the motor cycle division also is well represented.

The carnival was opened with an illuminated parade Saturday night, and it was the grandest affair of its kind ever witnessed in Chicago. The weather man, though, had a grouch. Early in the week, when no one was particularly anxious for it, he dished out regular summer weather, but Friday he switched and it became cold and disagreeable, accompanied by rain. All Saturday it threatened, but just the same Chairman Paulman and his associates went ahead with their plans. They won out in this competition with the weather man, for it did not rain. However, it was so cold that many people were kept indoors. In spite of this, though, it is calculated that some 50,000 saw the beautiful parade, which started from Michigan avenue and Sixteenth street, and followed the south side boulevards to Michigan and Thirty-ninth, then bending north to the north side and swinging back to Jackson boulevard, from which street the cars circled the west side and returned to the row. It was a well-planned route and gave the carnival considerable advertising.

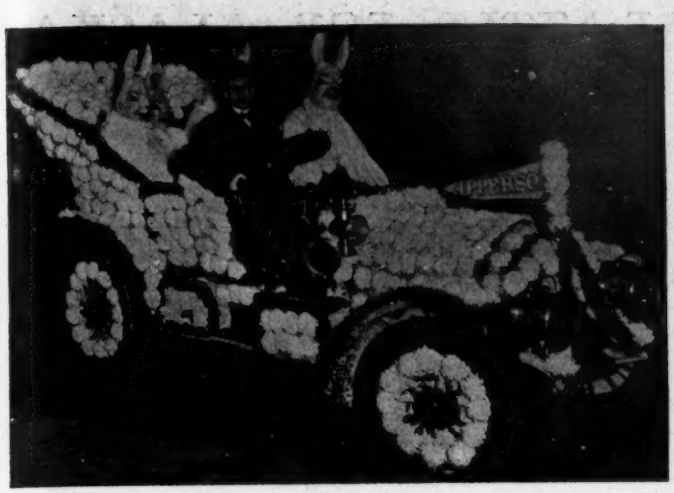


THOMAS ROADSTER, FIRST PRIZE WINNER

WOODS ELECTRIC, THIRD PRIZE WINNER

The judges, Ira M. Cobe, John W. McKinnon and George G. Greenburg, counted ninety-two cars in line when the parade went past the reviewing stand for the first time. All of them were not decorated, however, it being Chairman Paulman's idea to alternate an illuminated, then an undecorated car in order that the spectators might better study the beauties of the illuminated displays. It was no easy task picking the winners—there were so many beautiful designs. The judges stopped about twenty cars, lining them up along the curb, then studying them carefully before announcing their decisions. There were three prizes, but in addition it was decided that there should be ten given honorable mention. The judges' decision was as follows:

First prize—Thomas Flyer roadster, driven by C. A. Coey
Second prize—White steamer, driven by Miss Mildred Plew
Third prize—Woods electric, driven by Paul Frank
Those to get honorable mention were as follows
Apperson, driven by J. F. Gunther



APPERSON, HONORABLE MENTION

PIERCE-ARROW, HONORABLE MENTION

Ford roadster, driven by Robert Bartol
Vesta battery, a Thomas roadster, driven by C. E. Gregory
De Luxe, driven by E. E. Read
Stoddard-Dayton, driven by Marshal Rapp
Gearless, driven by H. W. Russell

WHITE STEAMER, SECOND PRIZE WINNER

Peerless, driven by John Bonschein
Pierce-Arrow, driven by Paul Hoffman
Pennsylvania tires, Mason car, driven by W. D. Rockwell
Indian motor cycle tri-car, ridden by John T. Fisher

The awarding of first prize to Coey met with the disapproval of some of the critics, although the Thomas was most elaborately decorated. Coey, being president of the Aeronautique Club of Chicago, seized the opportunity to advertise the sky pilots by using an air ship for his main idea. It floated above the car, a mass of flowers, with a propeller wheel in front and an American flag trailing behind. The flower idea was carried out lower down and the basket of the ship carried Coey and Miss Hall. Simplicity and beauty were aimed at in the White steamer and the judges hesitated a long time before they gave the first award to Coey. Miss Mildred Plew drove the steamer, a big white car. Miss Plew was dressed in white. The tonneau of the car was filled with flowers and above towered a flower sign, with the word "White" worked out in flowers. Probably no one in the parade spent more on decorations than did Carl Metzger, sales manager of the Woods Motor Carriage Co., on the Woods electric, that won third prize. Every possible point was covered by flowers and in addition a dozen beautiful white doves fluttered around and above the car. So artistic was this electric that the decision of the judges was followed by protests from many who thought the Woods ought to have been given first prize and that, too, without any hesitation on the part of the officials. The Stoddard-Dayton also was fancied as being worthy of being placed among the first three. The De Luxe idea also came in for favorable comment, while admirers of the Apperson thought the car deserved a place higher up in the final reckoning. The Gearless made a great hit, as did the Ford roadster and several others.

Some clever ideas were shown by those who got honorable mention. The Apperson was a clever conception in that the occupants wore rabbit heads. The Ford had hundreds of tiny incandescents concealed in tulips that followed the outline of the car, while the Pierce-Arrow was marked by a gigantic floral arrow extending the length of the car, while on top was a reproduction of the Glidden trophy. The Gearless had a gigantic polar bear perched on the bonnet and the occupants of the rig were dressed as Esquimaux—a sort of a reminiscence of the recent experiences of the Gearless in the New York-Paris race.

"That was the first contest in which I ever participated in which I had not figured on winning," said C. A. Coey today. "The decision of the judges surprised me. It cost me about $100 to decorate my car. The airship was simply a wire frame covered with flowers. It was about 12 feet long and 6 feet in circumference at its widest point."

The dealers' committee is not going to stop with the parade in securing publicity for the carnival, having prepared several other features for the week, one of which is the gymkhana for Wednesday night, when the boulevard will be utilized for a series of high gear contests which will include a slow race, a teter board affair, an apple race, "sabering the enemy" and dodging obstacles. On Thursday night there will be a tug of war between two motor trucks. It is probable the contending cars will be a Meiselbach and a Rapid, although this has not been definitely settled.

INDIAN MOTOR CYCLE, HONORABLE MENTION

THOMAS SAILS FROM SEATTLE FOR ALASKA

THOMAS CAR CROSSING SMALL STREAM IN CALIFORNIA IN NEW YORK-PARIS RACE

CHICAGO, April 1—Yesterday, the forty-eighth day of the New York-Paris, found the contesting cars well scattered, the Thomas leading the tail-ender, the Protos, by nearly 3,000 miles, having successfully completeed the voyage by water from San Francisco to Seattle from which point it was shipped today on the steamship Santa Clara, being due to arrive at Valdez, Alaska, April 6. The arrival of the Thomas in Seattle was marked by the same enthusiasm as was displayed at San Francisco, there being seventy cars, full of motorists, at the dock to witness the unloading of the American representative of the race. At Seattle George Schuster, who has been with the car since it left New York, became the official driver, and when the Thomas reaches Valdez he will pilot it along the trail to the interior of Alaska, traveling down the valley of the Yukon to Cape Nome. With him will be Captain Hans Hensen.

Edwin Ross Thomas, president of the E. R. Thomas Motor Co., is determined the car shall go all the way to Paris, and is indignant over the "knocks" which have been heard. He denies these reports, and in a statement just issued declares the Thomas Flyer is absolutely an ordinary stock car, selected only 6 days before the race, and not specially prepared or tested. Furthermore, he says it is identical in motor, clutch, driving shaft, radiator, carbureter, transmission gears, frame, wheels, bearings, and in all other essential features of its mechanism in use by Thomas owners. He also certifies that the Thomas Flyer ran from New York to Cheyenne, a distance of 2,028 miles, without overheating once; without repair or replacements of cylinders, spark plugs, transmission, radiator, bearings, clutch, carbureter, or other mechanical parts. In fact, the only breakage was two chain links, easily replaced, and a sprocket housing, he declares. Mr. Thomas says unless these malicious statements cease he will prosecute the "knockers." He offers a reward of $1,000 for proof that his assertions not correct.

While the Thomas was resting in San Francisco and later while it was making its water voyage, the Zust, de Dion and Protos were struggling to reach 'Frisco, to which point the Motobloc had been shipped by rail. Last Thursday the Italians left Cobre, Neb., hoping to make Goldfields in 2 days. The rest at Kelton had been utilized to put the car in shape. It intended to ship from Frisco by rail to Seattle over the Southern Pacific. The de Dion had just finished a hard run through the Echo canyon and across the Wasatch mountains, while the Protos was laid up at Point of Rocks, Wyoming, with a broken driving shaft, which Koeppen said meant a delay of 4 days before he could get the new part. Koeppen went to Ogden by rail, determined to mend the shaft at the shops of the Union Pacific.

Friday was marked by the receipt of a letter by Schuster from Secretary of War Taft, who inclosed another letter for Schuster to carry to General Picquart, the French minister of war. The Zust was headed for Goldfield after a comparatively tame trip, while the de Dion was in Ogden and about to cross the Great American desert. The Protos had been towed to Rock Springs, Wyo., to await repairs. On Saturday the Italians made Goldfield, while the de Dion passed through Kelton. The Protos

DAY BY DAY PROGRESS OF CARS IN NEW YORK-PARIS RACE

Date	Thomas	Zust	De Dion	Protos
March 26.....	San Francisco, Cal. 3,832 miles	Cobre, Nev. 2,718 miles	Echo, Utah 2,496 miles	Thayer, Wyo. 2,325 miles
March 27.....	Sailed for Seattle, Wash.	Ely, Nev. 2,859 miles	Ogden, Utah 2,536 miles	Rock Springs 2,345 miles
March 28.....	En route to Seatle, Wash.	Goldfield, Nev. 3,045 miles	Kelton, Utah 2,616 miles	Rock Springs 2,345 miles
March 29.....	En route to Seattle, Wash.	Goldfield, Nev. 3,045 miles	Cobre, Nev. 2,718 miles	Rock Springs 2,345 miles
March 30.....	Arrived in Seattle 4,836 miles	Doggatt, Nev. 3,371 miles	Ely, Nev. 2,859 miles	Granger, Wyo. 2,390 miles
March 31.....	In Seattle	Los Angeles, Cal.		Carter, Wyo.

Motobloc shipped to San Francisco.

still dallied at Rock Springs. The Zust passed through Death valley on Sunday, while the de Dion struggled through the Great American desert. The Zust checked in at Doggett, Cal., on Monday after having gone astray in Death valley, causing fears for the safety of the Italians. They extricated themselves from their dilemma when they encountered the encountered the Santa Fe road, which they followed to Doggett. The Protos had been fixed and had made a run of 70 miles to Granger, Wyo.

Thomas' Arrival in 'Frisco

San Francisco, March 26—The Thomas Flyer, bearing proudly the flag of the United States in the race of 21,000 miles between New York and Paris, arrived in San Francisco Tuesday afternoon about 4:30 o'clock. The American car at that time was more than 800 miles ahead of its nearest competitor, which was in the neighborhood of Ogden, Utah, beyond which point it had not progressed until yesterday, Wednesday. The de Dion was more than 150 miles beyond Ogden, and the Protos 200 miles still farther east. The Motobloc meanwhile was booming along on a Union Pacific flat car, bound for San Francisco. The victory of the American car was thus most pronounced on the first leg of the remarkable journey that the racers have undertaken. The Thomas will be shipped from this city tomorrow for Seattle, where it will be transshipped to another steamer, bound for Valdez, Alaska.

George Schuster, the mechanic who has been with the Thomas car continuously since it left New York, and who will remain with it until it arrives in the French capital, states the plan is to drive right along the Yukon river if they find that stream frozen. If, however, this does not prove to be the case, the work of the drivers will be much more difficult, and indeed, it may be found quite impossible to make any progress over the rough and broken Alaska country. Should this prove to be the case, it will be necessary to come back to San Francisco and ship to Siberia.

The arrival of the American car in San Francisco was made the occasion of the most remarkable piece of motoring enthusiasm ever witnessed in the City of the Golden Gate. For 50 miles from San Jose the Thomas was escorted by scores of cars and along the beautiful boulevard roads of Alameda county the racer set a pace that occasionally ran as high as 45 miles an hour. It was so fast some of the smaller and less powerful escorting cars were compelled to drop behind. In the city of Oakland, across the bay from San Francisco, the crowds in the streets were so dense it was only with the greatest difficulty that the racer and its escort were able to push their way through the mob of enthusiastic Californians.

In San Francisco the reception surpassed anything of the kind ever seen here. The lower portion of Market street about the ferry was jammed with people, and the entire street car system was tied up. Thousands of people waited patiently for hours to get a glimpse of the car that bid fair to carry America's flag to ultimate victory. There was no question of model or make; the Thomas was America's representative, and in the great string of cars that pushed along the street almost every agent in town was a prominent figure. Great crowds lined the entire route through the principal boulevard streets of the city and gave the men and the car many hearty cheers.

George Schuster, the mechanic on the Thomas, who is making the trip right through, tells an interesting story of the run. He says: "We struck snow right from the first, and our shovels were constantly busy. We soon found the Thomas car was breaking the way for all, since our friends and rivals simply fell into our wake and did not have to worry at all about the drifts that we had put out of their way. At the end of the third day we made an agreement that each car should lead and break the way for 3 or 4 hours and then drop back again. We tried this for 3 more days; then the Thomas took the lead and held it. The other cars were in garage ahead of us just 2 nights from New York to San Francisco. We have not seen the other cars since leaving Chicago. The longest day's run was from Erie, Pa., to Toledo, O., 221 miles, over snow. We simply stuck to it and kept going, making that distance in 14 hours.

"The worst roads we found in Indiana and Iowa. Iowa was one great sea of mud, thick and black and deep, so when you stepped into it you could not easily get back into the car. Nebraska was one of the best states we crossed. We had an enthusiastic reception in Cheyenne, and we carry a letter from the mayor of Cheyenne to be delivered to the president of France when we reach the French capital. From Laramie, Wyo., there were no roads—nothing but trails, big cuts, gullies, ditches and rivers. We crossed several rivers on the ice because that looked better to us than the railroad bridges. At Rawlins, Wyo., we received an unusually warm welcome. The people there shoveled snow for us for 8 miles. While they had no real roads, they tried their best to make what they did have as good as possible.

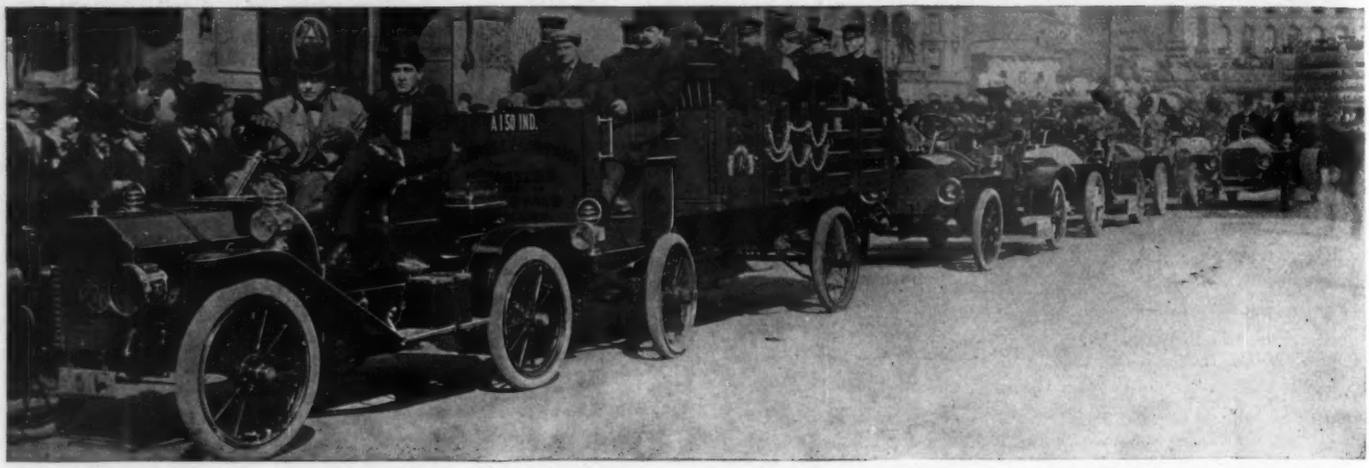
"When we got to Carter, Wyo., we found that the roads were so bad they were practically impassible. We took to the Union Pacific tracks there and went to Evanston, a distance of 42 miles, over the ties. Here we again tried the roads, but found them in such terrible state we went back to the railroad ties in preference. Through Echo valley we found the road so badly washed out that at places it looked as if we might drop down the side of the canyon, a distance of 300 or 400 feet. We slipped very dangerously one time, but our wheels on the inside of the railroad track held us up, and we gradually worked back to the level. This was one of the narrowest escapes we had from absolute disaster during the entire trip of 5 weeks across the continent.

"At Tonopah and Goldfield we were treated royally. We were banqueted and our pockets were filled with rich nuggets from the mines of the gold fields there. Then, from Rhyolite, more than 5,000 feet above sea level, we dropped down the Devil's Stovepipe to 49 feet below sea level in a very short space of time. We crossed Death valley at night. The roads of the desert were nothing more than shifting sand, and this was one of the worst propositions we had to encounter during the trip. It took us 2 hours 30 minutes to cover the 5 miles of desert.

"On reaching Ballarat we found that by taking a short cut to Mojave we could shorten the distance by 400 miles. Our idea was to get through by the best route and as quickly as possible, and that is why we did not go to Los Angeles. Our car could make 50 or 60 miles an hour, and with it in such fine running trim we did not propose to take any chances that were not absolutely necesasry. There is many a slip, and we did not care to have our rivals go by us while we were trying to get out of the bottom of some canyon on the way to this city."

ARRIVAL OF THOMAS CAR IN SAN FRANCISCO, BRINKER DRIVING

HOOSIER SHOW WEEK PROVES BIG SUCCESS



LINED UP FOR INDIANAPOLIS PARADE, SHOWING BAND TRAVELING IN STYLE IN A RAPID TRUCK

INDIANAPOLIS, IND., March 29—A supper and smoker at the Grand hotel, in which about 250 persons participated Saturday night, closed the second annual show held here all of last week under the auspices of the Indianapolis Automobile Trade Association. Without doubt the spring opening and show will become a regular event of each succeeding year. Much of the success of the week doubtless is due to the hill-climbing contest, obstacle races and the parade which attracted hundreds of strangers to the city. After they were here it was an easy matter for the tradesmen to line them up as purchasers of 1908 cars. In fact, between 150 and 200 cars, averaging about $2,000 each, were sold, so the amount of business done was better than anticipated.

Probably the feature that attracted the greatest interest from the general public was the parade on Wednesday afternoon, which was postponed from Monday on account of rain. Despite the postponement there were about 225 cars in line, the largest motor parade the city ever has seen. Of the number probably fifty were driven by persons living outside of Indianapolis. The parade formed in Monument place with the Rapid motor patrol wagon owned by the city, the police White steamer and Autocar runabout and the Marion runabout of C. E. Coots, fire chief, leading. Mayor Charles A. Bookwalter also was in the parade, driving over the route in a Marion runabout.

Music during the parade was furnished by a brass band riding on Schnull & Co.'s Rapid truck, and by a combination piano and player on Carlin & Lenox's piano truck. There were from two to six cars in line from each of the local sales agents, including about a score of big trucks and delivery wagons that brought up the rear. The parade was in four sections and was handled perfectly, each driver being given a number in the line, and this order was observed throughout the parade.

The Gibson Automobile Co. had a Ford runabout in line, driven by Walter Johnson, dressed as an Indian. With Johnson were two companions, one dressed as an Indian, the other as a clown. The Stoddard-Dayton touring car driven by Howard Hodson, which won three of the five hill-climbing events on Tuesday, also was in line, literally covered with long streamers of blue ribbon.

On Friday morning several thousand persons witnessed the obstacle races, egg-cracking contest and slow race on North Capitol avenue, between Vermont and Michigan streets. There were more than fifty entries in the four events and much amusement was created. The first obstacle race for stock runabouts, consisting in drivers driving between rows of cracker barrels, was won by a Pope-Waverly electric runabout, driven by Bixby, with an Autocar runabout, driven by Chillson, a close second. In the obstacle race for stock touring cars C. S. Hicks, of the Indianapolis Automobile Co., carried off the honors in a Cartercar. Harry Hammond, of the Premier Motor Mfg. Co., won the egg-cracking contest for all stock cars, with C. E. Gibson, of the Gibson Automobile Co., in a Ford, second. The slow race was won by Frank Staley, of the H. T. Hearsey Vehicle Co., in a White steamer, his time for one square being 2 minutes 56⅗ seconds. Harry Hammond, in a Premier, was second, his time being 1 minute 47⅘ seconds. The race was run on high gear. Since the hill-climb it has been announced that second place in event No. 5 was won by a National six instead of an Autocar, which was not among the starters. The National and Stoddard were the only ones to beat 40 seconds.

At the supper Saturday night the tradesmen talked over the success of the week, and it is estimated that the business amounted to about $400,000 for the week, much in excess of the business done during last year's show. Show week resulted in a number of new agencies, some of the cars now being represented in the city for the first time. The new agencies are as follows: Morton Place Garage Co., Great Western; Gibson Auto Co., Postal; Indianapolis Automobile Co., Jackson; Capital Auto Co., Babcock electric; Beck Auto and Livery Co., Pope-Tribune; Reagan Motor Car Co., Haynes; Indianapolis Motor Car Co., Couple-Gear truck; Knight & Jillson, Coppock truck; Harmon & Hall, Studebaker.

W. W. Reagan has just organized the Reagan Motor Car Co. and will handle the Haynes exclusively, which has not had a local representative before. At present the Reagan company is located with the Indianapolis Automobile Co. on West Maryland street, but later will be located in the new building of the Indianapolis Motor Car Co. on East Market street.

During show week the Fisher Automobile Co. announced its plans to build a new garage at Capitol avenue and North street. It will cost $30,000, and will be one of the largest in the city. It will be of steel and concrete construction, with brick veneer, and will be three stories high and fireproof. The building will be 82 by 135 feet, with 3,000 square feet of floor space, and will be equipped with two elevators, each having a capacity of 3,000 pounds. A parkway and drive will run through the building.

TENTATIVE RULES FOR GLIDDEN

New York, March 30—The new rules for the 1906 annual tour of the American Automobile Association and contest for the Glidden trophy are about completed, and will be issued probably by the first of next month. Many interesting changes have been made in them, calculated to inspire an unprecedented interest in this year's event. In the first place, the effort to straddle between a pleasure tour and a competition has been abandoned, and the affair is now being dealt with as a reliability touring contest pure and simple, that, in fact, being the official designa-

tion of this fifth annual tour. This removes the primary criticism to the event and the cry that has been raised every year concerning the impossibility of making a 2 weeks' tour leisurely enough for pleasure and at the same time strenuous enough for a test of motor cars. Following the same new policy, the touring board of the A. A. A. has introduced amendments and new rules to cover every criticism ever raised, with the aim of making the 1908 event the greatest touring test ever devised, and one to which both manufacturers and users can look for an honest and reasonable yet thorough test of the road qualities of cars. The trade will get a more frank recognition than ever without interfering with the prerogatives of amateur owners who may desire to compete for the sake of sport. When desired, the entrant may carry the name of his car on the radiator of it, which never has been allowed before. The rule regarding allowing contestants the time consumed in the repair of tires will go through, but the engine must be kept running during such delay, and no other work done except on tires, else the time lost will save to be made up by the contestants themselves.

WILL BE MONSTER CARNIVAL

New York, March 31—Indications point to next week's trade carnival in this city panning out an affair whose magnitude shall far exceed the most sanguine expectations of its promoters. The various committees have done their work well and the details already are complete. The decoration of stores has begun. Four main features are scheduled for the week. On Tuesday night there will be a monster parade of illuminated and decorated cars. Thursday will be given over to a climb at Fort George hill. A joy ride is scheduled for Friday night with Gramatan inn as the rendezvous for dance. Carnival week will wind up with a trade diner at the Automobile Club of America. The talk is now of the entries pointing to at least 3,000 cars in the parade on Tuesday night.

TEST A THOROUGH ONE

Cadillacs Go Through English Standardization Demonstration with Flying Colors

London, March 15—Sealed and locked up, the three Cadillac cars which went through the recent successful standardization demonstration conducted by the Royal Automobile Club are being held for the 2,000-mile international reliability test which will be held in July and in which one of the trio will participate, being sent off just as it is now after having been put through a test which speaks so highly for American motor car construction.

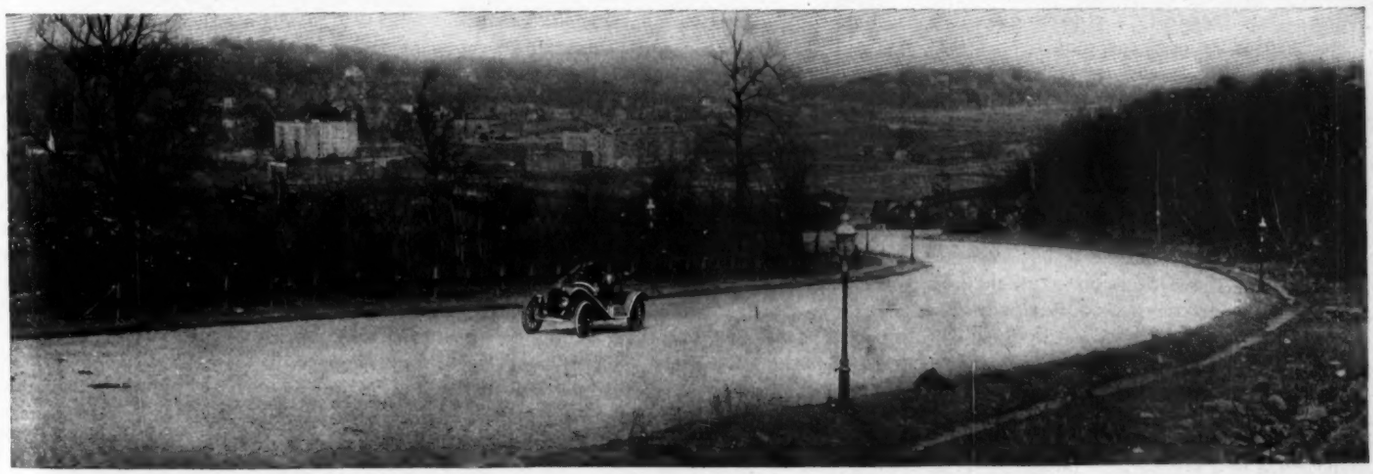
As anticipated in a previous letter, the standardization test was completed in a most successful manner by the three Cadillacs. Acting upon the suggestion of F. S. Bennett, manager of the Anglo-American Motor Car Co., handling the Cadillac, the technical committee of the Royal Automobile Club selected three cars from stock. They were driven to Brooklands and sent 25 miles on the track, making a total distance of 50 miles before mechanics were set to work dissembling them. This task done, the various parts were mixed up so it was impossible to determine which part came from any one car. Before the mechanics had finished reassembling the cars the technical committee added interest to the test by taking ninety-three of the parts and substituting others from the stock of spares at the Cadillac agency.

This job of reassembling was made harder because of rain flooding the sheds in which the cars were stored. The mechanics worked in water ankle-deep and some of the parts were rusted, which made it necessary to stop and clean them. Still, this did not feaze the Cadillac workmen and they finished the job in a masterly manner. The reassembling was started March 5 and the first car was ready to run after 7 hours' actual working time, the engine turning over on the first whirl of the crank. It took 10 hours to reassemble No. 2 car, the delay being caused by the time wasted cleaning the rusty parts. The third Cadillac was ready after 8 hours 30 minutes labor and like the first one started on the first turn of the crank. Then came the final test, the 500-mile trip on Brooklands track, designed to prove the standardization theory. Like all the others it was most successful, the three cars taking 3 days to the job, running 160 miles the first day, 180 the second and 360 the third. The diary of the test, kept by the officials of the Royal Automobile Club, is most interesting and reads as follows:

February 29—Three cars selected from stock, driven to Brooklands, and run ten times round track.
March 2—Dismantled car No. 1, and part of No. 2.
March 3—Finished dismantling car No. 2, and dismantled car No. 3.
March 4—Parts mixed up.
March 5—Commenced reassembling.
March 6—Finished reassembling car No. 1, which started on first turn of the handle. Actual working time taken to reassemble, 7 hours.
March 7—Commenced reassembling car No. 2. Saturday was a short day and the workmen were delayed by the shed being flooded.
March 9—Finished reassembling car No. 2, which started on third turn of the handle. Actual working time, 10 hours. Commenced reassembling car No. 3.
March 10—Finished reassembling car No. 3, which started on first turn of handle. Actual working time, 8½ hours. Workmen delayed cleaning rust off parts.
March 11—Commenced 500 miles' run, 160 miles being covered.
March 12—Continuation of 500 miles' run, 240 miles being covered.
March 13—Completion of 500 miles.

MAXWELL'S SHOWING IMPROVED

Milwaukee, Wis., March 30—Clarke S. Drake, referee of the Milwaukee Automobile Trade Association's 3-day reliability on March 11, 12 and 13, has announced that the penalizations on the Maxwell four-cylinder touring car, which won the contest, should be 200 points fewer than originally announced. The records are changed to give the Maxwell a penalization of 735 points instead of 935. This greatly increases the lead of the Maxwell over its nearest competitor. The penalization of the Maxwell was for a broken spring, and the observer stated that four men repaired it, while only two could possibly have worked on it at one time.



FORT GEORGE HILL, WHICH WILL BE USED BY NEW YORKERS NEXT WEEK

Published Weekly
The Class Journal Company
1200 Michigan Avenue, Chicago
New York Office, Flatiron Building

MOTOR AGE

Subscription Rates
United States and Mexico, per year, $3.00 Other countries including Canada, $5.00

Entered as Second-Class Matter September 19, 1899, at the Postoffice at Chicago, Illinois, under Act of March 3, 1879

NATIONAL CONTESTS AND THEIR VALUE

CLUB activity throughout the country gives promise of 1908 being most prolific in motoring contests of various natures, ranging from the free-for-all hill-climbs to the minute post-examination reliability run with all the technical inspection that goes with it. In the east every club of prominence already has announced its program which includes two and often three contests distributed over the summer months; in the west equal activity is evidenced; and those clubs bordering on the Dixie line and beyond it are abreast with the times in their summer contests with motor cars. By the end of September records of one nature or another in hill-climbs, economy trials, reliability runs and other mechanical tests will have been made but much of the value of them will be lost because of the local nature of the test or the lack of comparison among the many similar tests conducted by clubs in other sections of the country and under slightly different rules.

At the present time, while it may be impossible to formulate rules and regulations suitable for hill-climbing events in all parts of the country, or to arrive at a classification of cars for such events that would satisfy the contest committees of the scores of clubs that will conduct such events; yet a few basic regulations should govern all such events irrespective of where conducted or by what rules governed. The grade and length of the hill, together with its curves, road width and surface should be recorded in each contest so that with the time required in making the ascent, and the car horsepower and load, reasonably accurate deductions can be arrived at and comparisons made as to the relative hill-climbing abilities of cars, even if they did not compete in the same event or perhaps contest.

America is a big country in square miles compared with France, Germany, England, Italy, Belgium, Switzerland and other motor car-producing lands and due to this the trouble with obtaining a national hill-climb in which representatives of all the American cars would compete, is fraught with difficulties not encountered in smaller countries. While the local enthusiasm and local club effort have largely taken the place of national contests the conducting of a national hill-climb, economy test or reliability run would not detract in the least from the local club events but rather add prestige to them by way of establishing a standard with which all of the local club events could make ready comparisons.

The mind of man in the attainment of knowledgment must go through certain mental processes—examination, comparison, abstraction and generalization: The performances of individual cars are studied or examined; comparisons of these performances are made; the merits or demerits of cars as shown in such performances are abstracted or held in suspension in the memory; and lastly from all of the many performances the investigator is able to generalize as to the best cars in such contests irrespective of where the contest took place. No matter who the person, or where the locality in which he or she lives, he or she cannot arrive at a definite knowledge of the hill-climbing or other ability of a car without consciously or unconsciously going through these mental processes. Unless certain basic regulations apply to all of the contests of a season it is impossible to properly compare the merits of cars and consequently impossible to finally arrive at true conclusions as to the abilities of the contesting cars.

There should be each year a hill-climb, fuel test or endurance run that would bear the same relation to local events of this nature that the Vanderbilt, grand prix or Targa Florio bear to the local speed contests conducted on circular or other enclosed tracks. America has its national tour—the Glidden—but this has not mitigated against state tours started by local clubs; it has its national shows but also its local expositions; then why not its annual contests of natures outlined above, all of which would place the national seal of approval on such tests and instead of injuring the causes of clubs or state organizations would corroborate their work and establish for them a definite standard of comparison for the year.

WORKING FOR THE IDEAL MOTOR CAR

APART from the fact that there is always a large class of users who could have built the machine they own so much better than its creator —and this probably applies to motorists as a class to an even greater extent than in other lines—there also are many, who, without in any way wishing to belittle the achievements of others, form decided opinions of their own as to what should constitute the ideal motor car. Naturally, anything of this kind can, in the last analysis, be nothing more or less than an expression of the personal opinion of the writer. In fact, like so many other things, it never can be anything else except a matter of personal opinion, so no ideal car ever will become universal or anything like that, but inasmuch as many of these ideals are based upon sound enginering principles, and are, in many cases, the concrete result of observation and continued experience in the use of prevailing types, the subject is of more than merely academic interest. In support of the latter, it is only necessary to cite the increasing number of "home-made" cars now extant, and by this is not meant a mere assemblage of ready-made parts; but a machine constructed according to the builder's own ideals, and frequently, to a very large extent, with all his own labor.

It also must be borne in mind in considering this subject, however, that many of the cars now on the market do not represent the ideals of their designers. This may appear strange at first sight, but it must be remembered that it is the exception rather than the rule for a designer to be given *carte blanche.* Every motorist of experience has ideas of his own, and this includes the financial heads of the companies building the cars, not to mention the sales department, which constitutes a very influential factor. Some of the best motor car salesmen are credited with but a modicum of technical knowledge of the cars they are selling so that where this very important essential is concerned, what is wanted is saleability first, last and all the time. Last but far from the least is the unseen but unavoidable hand of fashion. *La mode* motor car and the hustling sales manager who keeps the wheels greased are a mighty force against which the designer of ideals finds it hopeless to contend, for most engineering ideals that have reached the market have been miserable foilures financially. Then, too, the designer is not the entire factory, and often superintendents, sales managers and agents have a voice in determining the season's fashion.

IN A most effective manner E. R. Thomas has answered the scoffers who had intimated that the Thomas car would not continue in the New York-Paris race after San Francisco was reached. The American representative in the international globe-girdling stunt, with a comfortable lead, now is on the second leg of the journey, while its rivals still are struggling to make San Francisco. As the race progresses the apparently insurmountable difficulties are disappearing one by one, and it would seem as if after all some one of the cars would get through to Paris. At the present time it looks as if the Thomas had a chance.

EVEN if Representative Bell of Georgia had to go back to 1904 for statistics which he used in his good roads speech in congress, he gathered enough facts to prove the United States is decidedly poorly equipped in the way of highways. It is hard to believe the average price per mile of the dirt roads of the country is $12, when it is remembered that road builders figure nowadays a road worth using cannot be built for less than $400 a mile and from that up to $4,000. Representative Bell must have stirred up his fellow lawmakers when he stated that statistics show that after 100 years of work on the highways this country only has 5 per cent of good roads and 10 per cent of those that can be classed as only fair. Opposed to this is the 85 per cent of bad roads. As showing what is possible with good roads, if rails may be called such, the representative points out that in 1904 there was 213,348 miles of railroads in this country, that 1,275,000,000 tons of freight was carried and that the railroads cleared $1 a ton profit. "The only hope for an aid that shall be all sufficient and permanent is from the national government," says the congressman, and it would seem there are other legislators at Washington thinking the same way. Once your Uncle Samuel is interested the motorists can begin to look for the good roads millennium.

INDIANAPOLIS had its spring opening last week, Chicago's is now on and next week New York cuts in on the circuit. The Hoosiers' affair was a business-getter, but Chicago has been handicapped by provoking weather conditions, so one is unable to get a line on the possibilities of such events in the Windy City. Experience is teaching that the weather man must be on the side of the dealers in the promotion of these carnivals, and it would be better for the trade to make sure of this strong ally before billing their shows in the future.

FROM the way every city or town of any prominence is scheduling some form of motor competition for the summer, it would seem as if there is more to the sporting end of the game than the cynics seem to think. There are reliability and endurance runs without number, relieved here and there by hill-climbs and road races. Only one point seems to have been overlooked—the promoters are not trying hard enough to interest the owner. A few of these affairs from which the trade is barred would do a lot towards strengthening the interest of the buyer in the competitions. The examples set by Detroit and St. Louis last year should be fololwed this season by clubs in all parts of the country.

NO ONE can object to Chairman Hower of the A. A. A. touring board calling a spade a spade. In making the Glidden tour an out-and-out reliability contest and recognizing that the trade is the backbone of the whole affair, he is cleansing the atmosphere and doing the tour a lot of good. Manufacturers assured of getting their just advertising dues out of it will strongly support the contest, and the public will also profit in that it will be an out-and-out sporting event—no makeshift in the matter. The announcement by Chairman Hower is frank enough to assure everyone of his sincerity on this point.

SEEDS sown by the American Automobile Association are beginning to bear fruit on the Pacific coast and the best feature of the harvest is that the results are bound to be of practical benefit to motoring. A state association is being formed in Washington and one of its objects is to erect small cabins in the wilderness in which can be stored gasoline and other motor supplies which can be used by tourists traveling through that section. This, however, is only one of the side issues. The main cry is for good roads and of course signboards. It is a pleasure to record that the efforts of the organizers are meeting with great success and that in all probability the coast soon will become a veritable hotbed of motoring. Here's hoping the good work in this line will be carried through to success by the enthusiasts on the Pacific coast.

IT IS indeed bearding the lion in his den when an American maker can put over such a stunt as the one which the Cadillac has so successfully accomplished in England. Now there can be no one over there who can doubt the accuracy of American automatic machinery, and John Bull surely must know there really is something to the standardization of parts idea. All that remains to make the coup complete to force Mr. Bull to capitulate is to have the Cadillac representative go through the international reliability tour with at least a fair showing, and those who have watched the recent test believe it will.

The Week in Brief

A. M. C. M. A. decides to coöperate with Automobile Club of America in the promotion of another show next winter; city-to-city show scheme discussed.

Representative Bell, of Georgia, makes startling good roads speech in congress, introducing many interesting statistics.

Cadillac standardization test in England carried through to a successful ending; details of the trial.

Racers already training on Dieppe course for French grand prix; new scheme for stands evolved.

Thomas car reaches Seattle in New York-Paris race; others still struggling to reach 'Frisco.

Indianapolis' show week proves a big business getter; parade attracts many motor rigs.

Indications that New York will have 3,000 cars in its motor pageant next week.

Frelinghuysen bill, increasing registration prices, passes New Jersey senate.

E. P. Chalfant made assistant general manager of the A. L. A. M.

Chicago's spring carnival now on; big illuminated parade is held.

Coming Motor Events

Canadian Shows—Third annual show in Montreal, April 4-11. R. M. Jaffray, Toronto.

Pittsburg Show—Automobile Dealers' Association of Pittsburg show. Duquesne garden, April 4 to 11.

Denver Show—Three-day show in Denver, April 6, 7 and 8; G. A. Wahlgreen.

Roadability Run—Quaker City Motor Club's roadability test, Philadelphia, April 11.

Westchester Road Race—Stock car chassis road race in Westchester county, New York, for Briarcliff cup, April 24.

Norristown Endurance Run—Endurance run of Norristown Automobile Club, Norristown, Pa., 122.9 miles, April 28.

Detroit Test—Detroit Automobile Dealers' Association's endurance run, April 29, 30 and May 1.

Harrisburg's Test—Endurance run of Motor Club of Harrisburg from Harrisburg, Pa., to Philadelphia and return, May 4.

Targa Florio—Third annual Sicilian road race, May 10.

Endurance Run at Hartford—Automobile Club of Hartford's endurance run, Hartford, Conn., May 15.

GIVES UNCLE SAM ROAD FACTS

Representative Bell, in Speech in Congress, Points Out that Only 5 Per Cent of American Highways Can Be Classified as Good—Startling Statistics Furnished

Washington, D. C., March 27—A splendid good roads speech was made in congress this week by Representative Bell, of Georgia. He said in his opinion the time has come for the national government to inaugurate a policy that shall give the country the best system of roads known to the world. Continuing he said:

"The good roads question is no longer a merely local one. The great questions of transportation have given the country roads of the entire country an importance equal to that of railroads and of the public waterways. No matter how much agriculture or mineral wealth is transported over these systems of transportation to final destination and market, the initial transportation of all of it is over the country road. From the farms or mines to the stations or the wharves is the first element of the transportation problem, while from the wharves and stations to the market is but its second phase.

"The total mileage of all the railroads in the country in 1904 was 212,348 miles. The improved country roads in California alone that year aggregated 50,000 miles, or nearly one-fourth of the railroad mileage of the country. Maryland had 16,000 miles; Massachusetts, 20,000; New York, 14,000. These four states have an aggregate of improved roads of nearly one-half of the railroad mileage of the country. From this it will be seen how great is the aggregate of the improved and the unimproved country roads of the country, equal factors in transportation with the railroads of the United States.

"The freight carried by all these roads in 1904 aggregated 1,275,000,000 tons, or the unthinkable quantity of 2,550,000,000,000 pounds, earning for the railroads $1,374,100,000, or more than $1 per ton. There were 9,840,000,000 loaded freight cars traveling over the country that year. Can anyone figure out the enormous number of wagonloads, the enormous number of trips made by the 15,000,000 horses and mules carrying these colossal weights to the nearest station? Will anyone say, in the face of figures like these, that transportation necessitated for this enormous railroad traffic should not have the most favorable consideration at our hands?

"After 100 years of crazy patchwork we are able to show a system of roads in which 5 per cent are good, 10 per cent fairly passable, and 85 per cent bad, indifferent, execrable, or worse. To build an improved road according to well-advised plans costs from $100 to $400 a mile where sand and clay are used, and from $3,000 to $9,000 per mile for macadamized roads. Under the present system it has been estimated that our dirt roads cost $12 per mile. It is evident that a system which affords $12 a mile cannot be relied on to give roads that cost $400 per mile, much less the better roads costing $3,000 a mile. It is also evident that the states, generally working alone, cannot reasonably be expected to furnish the means to build a general system of macadamized roads, and yet it is to that system that the United States must come if it is to compare in any sense with the enlightened countries of Europe in any system of well-devised roads on this continent.

"California in 20 years has expended $49,500,000 on 50,000 miles of country roads, but is still a long way from having a complete system of good roads. Connecticut appropriated $225,000 in 1903 to build 450 miles of roads, paying $3,000 a mile for gravel roads and $6,500 per mile for 16-foot macadamized roads. Illinois appropriates $25,000 a year to aid the counties in the improvement of roads. Maryland appropriates $10,000 a year to keep up and improve 16,000 miles of roads. The counties of Maryland maintain about 900 miles of shell, stone and gravel roads. It is estimated that the counties of this state spend annually for road maintenance about $600,000 and that the people pay in tolls on 497 miles of toll road about $140,000. The average hauling distance in Maryland is 6.7 miles and the average load per horse about one-half a ton. The average cost of hauling a ton 1 mile is 26 cents, and the cost of the macadamized roads 20-foot wide, macadamized 12 feet, is from $4,000 to $6,000 a mile. In 1904 the legislature of Maryland appropriated $200,000 for the construction of macadamized roads.

"Massachusetts appropriates $450,000 per annum for constructing and $60,000 for maintenance. This state already has put $6,000,000 in her roads, and has recently appropriated $2,250,000 more for a 5-year expenditure. The 12 to 15-foot stone roads of the state cost about $5,750 a mile and the gravel roads from $3,000 to $4,000 a mile. Up to October 1, 1905, they had built 615 miles of roads. There are 20,000 miles of road in the state, of which 1,900 will eventually obtain state aid. The great body of the roads in this state will have to be improved locally or go without improvement.

"From all these considerations it is evident, to my mind, that the states cannot be looked to with any degree of assurance for that aid which will improve the public roads used by the neighborhood farmer. The only hope for an aid that shall be all sufficient and permanent along these lines is from the national government. In my opinion we have an undoubted right to do what is asked for by any one of the three bills now before us, the end of each being the appropriation of about $24,000,000 or $25,000,000 to the states to aid them in the improvement of the dirt roads in the country, this end being reached in two of the bills by direct appropriations and in the other by an apportionment of the surplus revenues among the states in the ratio of their representation in the union."

Will Be Opening Wedge

Washington, D. C., March 30—The Currier bill providing for the creation of a national highway commission and for the construction, improvement and maintenance of public highways, is attracting much attention, not only in congressional circles, but among motorists and good roads enthusiasts throughout the country. It is generally conceded that Representative Currier has drawn the best bill looking to the improvement of the public roads that has ever been introduced in congress, and while it is admitted that the bill has no chance of being enacted into law at this session, it will prove the entering wedge into the movement now under way to secure federal aid in improving the country's roads. In an interview with the Motor Age correspondent Currier frankly admitted the bill had no chance at this session, owing to the mass of appropriation bills and other matters that would effectually block its passage. "My bill," said Mr. Currier, "will not come up at this session, but it is sure to be heard from in the future. The proposed national highways commission would have a tremendous opportunity to work for the country's good, and I am sure the sentiment of the people at large is with me on the proposition for good roads."

Plan Interstate Highway

Denver, Col., March 28—A movement to build a great interstate highway from Yellowstone park to the Grand Canyon of the Colorado in Arizona was launched in Denver recently. The project is backed by the Colorado Automobile Club and the Denver real estate exchange. General William J. Palmer, the veteran railroad builder, of Colorado Springs, and one of the leading public-spirited men of the west, was chosen to head the movement and was elected president of the Rocky Mountain Highway Association. Charles A. Johnson, a member of the real estate firm of Lyons & Johnson, of Denver, was chosen first vice-president, and Thomas F. Walsh, the wealthy mine owner and an enthusiast on good roads for motor cars, was named as second vice-president. Alva Adams, of Pueblo, ex-governor of Colorado, and now a banker, is third vice-president, and Harold Kountze, director of the Colorado National Bank, is treasurer. The association proposes to awaken a strong sentiment in municipalities, counties and states in favor

of building good roads in every direction and to secure an appropriation from congress to build a highway through the Rocky mountains for a distance of 1,000 miles at an estimated cost of $10,000 a mile. The proposed highway would run from a connection with the government highway through the Yellowstone National park on the western border of Wyoming, through Wyoming and Colorado, touching the cliff dwellers' region, going through a portion of southeastern Utah, into the Navajo country, and down the Grand Canyon of the Colorado in Arizona.

ANOTHER POPE RECEIVER

Toledo, O., March 28—Judge Taylor of the United States district court, after a hearing of the claims of the creditors of the Pope Motor Car Co., of Toledo, settled, at least for the present, the controversy between the present receivers and the creditors, by the appointment of F. A. Scott, secretary of the Superior Trust Co., of Cleveland, to act as a third receiver, in conjunction with Receivers Albert L. Pope and George A. Yule. The dispute arose on two separate motions filed by creditors asking for the removal of the receivers on the ground that they were conducting the affairs of the local concern in an unfair manner, and were discriminating in favor of the Pope Mfg. Co., in which they had a personal interest. These creditors represent an aggregate of about $260,000 against the Pope Motor Car Co. The court refused to discharge the receivers for the reason that they might be valuable to the future conduct of the matter, but announced that to retain them alone would be intolerable, as they could not satisfactorily represent both sides, so he would appoint a third receiver. Judge Taylor indicated it would be the special duty of the newly appointed receiver to protect the claims of creditors of the Pope Motor Car Co., against which is the disputed claim of Albert L. Pope or the Pope Mfg. Co., amounting to about $800,000. It is thought that this will prove a solution of the entire difficulty, and that the local plant will now be satisfactorily operated until such time as it can be sold as a running institution.

PASSES ON WHEEL TAX

Chicago, March 28—Judge George A. Carpenter, of this city, has upheld the validity of the tax on vehicles using the public streets of Chicago for hire when he overruled the contention of the Harder Fireproof Storage and Van Co. that the ordinance was invalid because it attempts to levy a double or triple tax. "The power of the legislature to impose taxes is nearly unlimited," the judge said, "and a court of chancery will not interfere unless a complete usurpation of power not given it is shown." This, it is believed, will not injure the case of the Chicago Motor Club, which has applied in another court for an injunction restraining the city from enforcing the wheel tax.

IS AFTER BEST ROADS

Michigan Ambitious to Possess Finest Highways in America—General Movement On

Grand Rapids, Mich., March 30—Road building in Michigan will be quite general during the coming spring and summer and if the advance which is promised for this season is carried on for a number of years the state soon will have the finest roads of any state in the union. One place where the road building will be especially noticeable will be in the copper country of the northern peninsula, and while at present motor cars are not largely in use in this part of the state, there will soon be road inducements enough to increase the number of cars in that vicinity, it is thought.

It is understood that in Keweenaw county there will be extensive building. A road to the Ojibway mine long has been needed and this probably will be provided. Parts of the county road also will come in for improvement and it is likely this idea will be followed out by other counties. There is no reason why the commercial motor car could not be employed to good advantage in transporting ore and copper and it is likely some of the mines may adopt this method. The money expended in road work in Calumet township and the village of Laurium probably will total at least $50,000. The township authorities have outlined a scheme which will make the streets and highways better for travel than ever before. In Laurium there will be paving of two streets at an expense of more than $10,000. Other streets will be macadamized. Trap rock is being used for the foundation of some of this work, the rock having been laid before snow fell last winter.

Mason county supervisors have accepted the report of the road commissioners which calls for the expenditure of $20,050 for new road building and repairs this year and this summer promises to witness some activity in this lower peninsula county. Since Manistee county adopted the good roads idea about 2 years ago it has received $10,000 in state rewards. The county now can boast of 50 miles of excellent road and at about 30 per cent of the cost under the old system of paying road taxes with labor. It is likely considerable money will be spent this year in further improving the highways and in keeping in repair those which already have been improved.

Alpena county has the most miles of good roads, according to State Highway Commissioner Earle, and such interest has been aroused in this county that plans are under way for the addition of new roads and the repairing of old ones in order to maintain the reputation the county already has along this line.

The business men of Alma have formed a good roads association, the object being the improvement of the roads in Alma township and Gratiot county. A permanent organization has been effected, with Dr. J. H. Lancashire as president, C. F. Brown as secretary and Frank Convis as treasurer. As an inducement to the improving of roads in this vicinity the Alma Sugar Co. has offered $100 for every mile of road built under the state law within 8 miles of Alma.

At the coming spring election the voters of Muskegon county will vote on a proposition to build four bridges in that county which will be a part of the good roads system. Iron county also is considering a bonding proposition.

PLANS ITS FIRST BIG TEST

Philadelphia, Pa., March 30—The youthful but energetic Norristown Automobile Club, of Norristown, Pa., has decided to inaugurate a series of sporting fixtures to round out its winter activity along legal lines. The first event on its schedule will be an endurance run, to take place April 28 over a 122.9-mile course. Starting from the Hotel Montgomery in Norristown, the route will be via Bridgeport, King of Prussia, Howellville, Downingtown and Coatesville to Lancaster, the lunch stop. From Lancaster the route will lie through Oregon, Akron, Ephrata, Reamstown, Adamstown and Shillington to Reading; thence home via Pottstown. Checkers will be stationed at Coatesville, Lancaster, Reading, Pottstown and at the finish. Unlike the majority of promoters in eastern Pennsylvania the hustling Norristowners have not considered it necessary to secure Philadelphians to run their events for them, the home-talent officials being: Edwin S. Nyce, referee; Oliver F. Lenhardt, starter, and Abraham S. Hallman, assistant starter—with the club's contest committee in general charge.

PULLMAN GIVEN THE RACE

Philadelphia, Pa., March 30—Although its rival, the Studebaker, collared all the ovations at Savannah by reason of having been the first to arrive at the Georgia metropolis in their recent race from this city, the Pullman contingent gathered the real honors yesterday, when its car was announced as the official winner by the contest committee of the Quaker City Motor Club. The grounds for the committee's decision were the failure of the Studebakerites to adhere to the predetermined course, cutting across country in order to reach Savannah on time; the absence of the official observer for several days; the relaying of drivers, sending the tired man ahead by rail to rest up until the car reached him. The decision meets the approval of all the local enthusiasts. L. E. French, the local Pullman agent, is, however, dissatisfied with anything but a clean-cut victory, and has challenged the Studebaker for a similar contest up to 1,000 miles for any amount up to $5,000,

SAYS SHOW IS SURE

A. M. C. M. A. Announces It Will Join A. C. A. in Promoting Next Winter's Exhibition

New York, March 30—That there will be another show at the Grand Central palace next winter and that the American Motor Car Manufacturers' Association will exhibit at it was practically settled yesterday. Officials of the independent organization had had a series of conferences with representatives of the Automobile Club of America. Under just what terms the association will again do business with the club has not been settled, or at any rate not been made public. There was an air, however, of beaming satisfaction upon the faces of the A. M. C. M. A. committeeman who was interrogated on the subject. In view of the well-known friction between the two over the expenses and rebates of the last show, it is safe to say the independent manufacturers will be a bit more in the open in the promotion of the next show, the regulation of its expenses and the division of its receipts than it modestly was last year.

During the course of yesterday's meeting a suggestion that the association promote a city-to-city railroad exhibition was received with so much favor that a committee was appointed to report on it at the next meeting. It must not be inferred, however, that the A. M. C. M. A. ever had any intention of abandoning the annual exhibition of its cars in New York or that this railway exhibition was for a moment thought of as a substitute for the regular independent show. If the scheme goes through it will constitute an additional form of exploitation for the cars of the fifty-two members of the A. M. C. M. A.

The project originated with Charles E. Lewis, of the Jackson Automobile Co. In outline it calls for a train of thirty freight cars to carry the machines and a train of Pullmans for the salesmen and demonstrators. It is calculated that the trip will last 3 months, the duration of the stops, of course, depending on the trade importance of the cities en route.

It is proposed to make the start from Detroit, going to Cleveland, then to Buffalo, Rochester, Syracuse, Utica and Albany. Continuing the tour the cities to be visited will include Springfield, Worcester, Boston, Providence, Hartford, New Haven, Bridgeport, New York, Newark, N. J., Atlantic City, Trenton, Philadelphia, Baltimore, Washington, Richmond, Charleston, W. Va., Pittsburg, Columbus, Cincinnati, Indianapolis, St. Louis, Kansas City, Omaha, Des Moines, Minneapolis, St. Paul, Milwaukee, Chicago and Detroit, all the cities en route having a population of 100,000 and over. At each it is planned to give hill-climbing and other demonstrations to participate in such tests as may be promoted by the local clubs or dealers. Of course, demonstration cars will be carried.

At yesterday's meeting trade conditions were discussed and routine business was transacted. In attendance were H. O. Smith, Premier Motor Mfg. Co.; G. V. Rogers, Mitchell Motor Car Co.; R. M. Owen, Reo Motor Car Co.; C. C. Hanch, Nordyke & Marmon Co.; W. H. Van Dervoort, Moline Automobile Co.; S. H. Mora, Mora Motor Car Co., and Alfred Reeves, general manager. In the absence of Benjamin Briscoe, the chairman of the committee the chair was filled by H. O. Smith.

HOTCHKISS VISITS CANADA

Toronto, Ont., March 28—The annual dinner of the Ontario Motor League held last night was a notable affair. One of the principal speakers was President William H. Hotchkiss, of the American Automobile Association, whose remarks found much favor with those present, for the reason that just now the Canadians are experiencing some very annoying forms of drastic legislation. Duncan McDonald, president of the Automobile Club of Canada; U. H. Dandurand, vice-president of the Ontario Motor League; Mayor Oliver; E. B. Ryckman, K. C.; Dr. Godfrey, M. P. P.; Lloyd Harris and William Stone were among the other speakers. President J. A. Russell presided, and the first toast was to the king, whom the speaker referred to as a distinguished motorist who had a new model every year, who carried no number, and who was harrassed by no laws.

A. L. A. M. JOB FOR CHALFANT

New York, March 31—Special telegram—At a special meeting of the A. L. A. M. executive committee held today to fill the vacancy caused by the resignation of M. J. Budlong, former general manager, E. P. Chalfant was elected with the title of assistant general manager. Mr. Chalfant has been identified with the motor industry for some years, being sales manager of the Waltham Mfg. Co., which is a member of the licensed association. As a board member representing the Waltham company he is entirely familiar with the policy and methods of the association. He was a member of the traffic committee of the licensed association and a board member of the National Association of Automobile Manufacturers. It is expected Mr. Chalfant will assume the duties of his new office on April 15.

VOLUNTEERS WILL COMPETE

Philadelphia, Pa., March 30—A feature of the roadability run of the Quaker City Motor Club, on April 11, will be the participation in the run of the First Volunteer Motor Corps of America. A practical demonstration will be given of the feasibility of mobilizing the corps in time of need. Governor Fort, who will be at Cape May on the 11th, has consented to award the prizes to the various winners. He will be assisted in his task by ex-Governor Warfield, of Maryland.

TRAIN FOR GRAND PRIX

Racing Drivers Already Whizzing Over Dieppe Course—New Stand Scheme Evolved

Paris, March 22—Racing drivers are already active on the Dieppe course, and so great has been the rush to the Dieppe triangle that the police have had to take special measures to enforce the speed regulations in all villages. Panhard, Brasier, Bayard-Clement and Renault have been among those putting in a large amount of time during the past week. The three Renault racers now out have a close resemblance externally to those of last year. The four cylinders, cast in pairs, are 155 millimeters bore by 160 millimeters stroke, which is rather less than the majority of French cars constructed for the grand prix. Valves are all on one side, operated by a single camshaft. The engine is cooled on the thermo-syphon system, with multitubular radiator behind the engine, according to general Renault practice. There are three speeds forward by progressive sliding gear, shaft-drive, and, according to the driver's declaration, no differential. It will be remembered that the Renault which captured the first grand prix was also without differential.

An idea of the effort that is being made by Mercedes to recapture speed laurels may be judged from the fact that ten racing cars are being built, three of which are already on the road. In general lines there is nothing which distinguishes them from last year's models. The engine is declared to have the maximum bore and a stroke of 170 millimeters. Low-tension magneto is employed with Bosch magneto.

Great Britain has selected an excellent team of racing drivers for the three Austin cars entered in the grand prix. Lee Guinness, the rich amateur driver, known to the world by reason of his connection with a certain brand of stout, stands forth in the motoring world as the owner of the 200-horsepower eight-cylinder Darracq, recognized as the fastest car in the world. Resta, who will handle the second car, has an excellent reputation as a driver of fast cars on the Brooklands track, and Warwick Wright, the Darracq representative in England, already has won sufficient races at Brooklands and on the road for him to be considered the equal of any of the continental drivers. Weigel, who drove his own car in the last grand prix, will be a spectator this year, the withdrawal of his license making it impossible for him to handle a car in his own country. The only driver who has been definitely selected is Coleman, who is little known outside of home circles.

After considering several schemes the Automobile Club of France has decided on a form of grand stand for the grand prix differing from any adopted heretofore. The main stand and everything connected with

it is on the outside of the course, about half a mile from the Dieppe hairpin turn. On the inside of the course is nothing but the starter's box and the score board, this latter being a long low placard, its highest point less than 3 yards from the ground. Opposite the grand stand the road has been made double width, the inner half being reserved for cars running in for tires, gasoline or other provisions. A long shallow pit has been built the full length of the inner road, and it is in here that the gasoline and tire stations will be established. Behind this row of boxes is a passage communicating with the entrance to each stand.

The grand stands proper commence some distance from the tire stations and rise up at such an angle as to allow a perfect view from every row. The general arrangement recalls forcibly that of Madison Square garden for the 6-day bicycle race; the circular passage between the spectators' seats and the track in this case being the tire and gasoline stations. At one end of the grand stand will be a high tower, one story of which will be reserved for notables and the other for members of the press, telegraph connection being brought into the rear of the press room. Behind the main buildings will be the restaurant, garage for racing cars, and separate garage for visitors' cars.

Being on the outside of the course access to and from the grand stands will be possible at all hours, even the main road from Dieppe can be kept open until a quarter of an hour after the start. Should it be considered necessary the racers will be started from the inner half of the road, leaving the main portion of the course free for the passage of cars finishing the first round and passing at speed. As each machine must cut in for stoppages, to take on gasoline and change tires, the full width of the road opposite the grand stands will never be encroached upon for this purpose.

Plans now being fully decided upon, constructive operations will commence immediately and protective barriers around the course will be erected as early as posible.

MUD PREVENTS PRACTICE

New York, March 31—Deep mud on the bad stretches of the Briarcliff course is interfering with the start of practice for the race. Paul La Croix's protest on behalf of the Renault against the Fiat and Isotta cars on the ground that they are not stock cars has been practically disallowed by the technical board of the race, which has ruled that, being built for the kaiser cup, which was essentially a race for touring cars, they are eligible providing they come within the piston displacement limit and the requirement that ten cars of a like model have been manufactured.

WILL TALK ON CUP RACE

New York, March 31—The A. A. A. racing board will meet on Thursday to discuss racing rules and the Vanderbilt cup contest set for next fall.

ALL FOR THE TOURIST

Chairman Hower Tells What American Automobile Association Is Doing in His Line

New York, March 31—How broad in scope has become the work being done for motorists by the American Automobile Association is illustrated by the information for tourists now in hand and being compiled. The office of the touring board at Buffalo is a busy place these days, where the officials and half a dozen expert assistants are forced to work long hours to keep in shape the vast amount of information arriving and answering the inquiries received from members. Speaking of the work of the touring board, and how the fact of the A. A. A. being truly national in its character enables it to do what none other can, Chairman Hower has the following to say:

"It must be remembered that the touring board, besides the chairman and Secretary Lewis, has ninety members, located in as many sections of the country. During the past year, the local clubs of the American Automobile Association have been laying out routes, radiating from their respective cities, copies of which have been forwarded to the touring board office and by the touring board arranged in files, from which copies can be readily made on the application of members. This information could not be gathered by an individual, nor by an individual club at any cost, but only by a body such as the American Automobile Association, by reason of the clubs affiliated with it, numbering now 126. It is the intention to next year publish this information in the A. A. A. year book, which will be the most comprehensive and complete compilation of touring information ever produced.

"This year's book of the A. A. A. tour will contain, besides the route, a complete list of the hotels and garages in towns of 5,000 inhabitants or over, in twenty-seven states. These books will be sent free of charge to every member of the association—some 18,000 in all. The guaranteed rates quoted will prevail only for members on presentation of their 1908 membership card.

"Through its touring board, the A. A. A. has opened an office in Paris, at 4 bis rue Descombes, presided over by Victor Breyer. Mr. Breyer is an American who has spent the last 6 years in Paris. By arrangements made through Mr. Breyer, a member of the American Automobile Association can rent a first-class car of almost any manufacture he desires at a reasonable rate, the price covering all expenses of every description, including tires, gasoline, repairs, garage charges, chauffeur and the chauffeur's personal expenses. These arrangements can be made at the touring board offices in Buffalo, or at the secretary's office in New York, and the car selected will be at the place in Europe designated at the time named. The touring board files contain information of all description, such as import duties, car and driver's licenses, together with routes, descriptions and conditions of roads. Arrangements have been made with the American Express Co., covering the shipment of motor cars to any foreign port at a lower rate than can be obtained by anyone other than A. A. A. members. All of this assistance is absolutely free to members of the A. A. A."

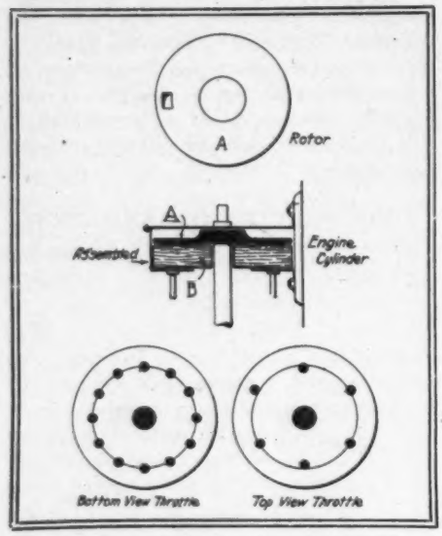
FIND NEED FOR ORGANIZATION

Paris, March 24—Motoring France has gone forth to war against a new law brought before the chamber of deputies by Minister of Public Works Barthou. The Automobile Club of France has drawn up a petition and is preparing to obtain 200,000 signatures, and every association connected in any way with motoring has been enlisted in the campaign against the proposed changes. Under the proposed law a casier will be created for every person holding a permit to drive a motor car. The casier consists of a record of the holder's doings, and will be filed at some central office, probably a branch of the ministry of public works. Thus at any time it will be possible for the authorities in any part of France to obtain a complete record of the career of a driver charged with any offense. Such a control would be absolute, and would make it impossible for a driver to obtain a license in one district while under penalization in some other part of France. The system is similar to one at present in vogue in police quarters, and applying not only to natives, but to all foreigners having a permanent residence in the country. The distinctive difference is that the motoring casier would be under the control of the ministry of public works and entirely independent of the police authorities. Though there is little in the casier scheme to which a right-minded motorist might make objection, the section of the law dealing with the withdrawal of license after two judgments have been pronounced against a motorist is objectionable and has brought forth the loudest protestations from the motorists.

FRELINGHUYSEN BILL PASSES

Trenton, N. J., March 31—Special telegram—The senate last night passed the Frelinghuysen bill. Among the changes in the present law are: Registration fees are raised from the present rates of $3 for vehicles below 30 horsepower and $5 for those of 30 horsepower or more to $3 for vehicles below 10 horsepower, $5 for vehicles between 10 and 30 horsepower, and $10 for vehicles 30 horsepower and above. It increases the driver's license fees from $1 and $2 to $2 and $4. Manufacturers' licenses are to be issued annually at the fee of $25 for five cars. Frelinghuysen also is the father of the original bill.

The Readers' Clearing House



ASSEMBLY OF CARROLL ENGINE'S THROTTLE

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems and opens its columns to a discussion of pertinent subjects. Correspondence is invited from subscribers and others.

CARROLL'S NOVEL MOTOR

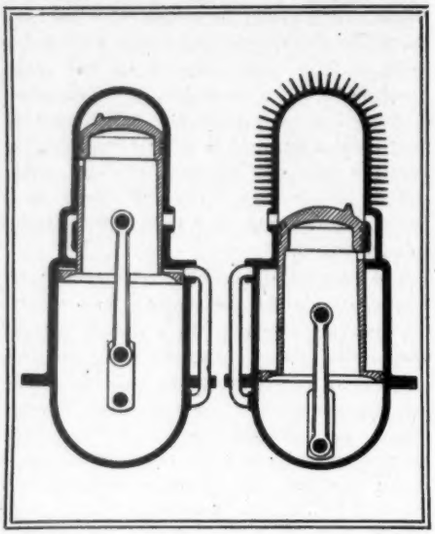
St. Ansgar, Iowa—Editor Motor Age—Despite the fact that there are new motors constantly being placed on the market—each being an attempted improvement over previous models—the field for invention in that line is still open, and numbers of investigators are working on the two-cycle principle. In the issue of August 22, 1907, of Motor Age, Victor Lougheed describes a convertible two-four-cycle form of internal combustion motor which, although its simplicity and positive action might be questioned, has some decided advantages over the ordinary forms, both two and four cycle. Regarding the matter of simplicity, the fewer valves a motor can be provided with and still function properly, the better. Mr. Lougheed supposes that if a given amount of air is used to cool the Frayer-Miller engine, his should cool with several times that amount, without taking into consideration the difference in the radiating surface of the engines in question. The Frayer-Miller being provided with spines for radiation and convection of the heat, would naturally get rid of more than an engine with whose polished surface the air comes in contact. Further, all the air forced through the Frayer-Miller jacket would absorb an equal amount of heat, while with the Lougheed, that nearest the center of the cylinder would get little or none. While we would like to see Mr. Lougheed's ideal realized, it appears at present impossible, as well as having the disadvantage of consuming two distinct cycles for scavenging and cooling. Not wishing to criticise the work of another without offering a substitute, I hereby submit blue prints and a description of an engine of my invention.

The supplementary piston pumps its air into its neighbor's crankcase, which with the volume inspired on the upstroke of the piston gives an excess volume to be transferred through the by-pass at the completion of the working stroke. This results in complete scavenging and leaves only pure air in the cylinder to be compressed and mixed with the injected fuel, all being accomplished without the use of valves or valve-operating mechanism. Air is admitted to the various crankcases and supplementary piston chambers through a rotary valve, mounted on the crankshaft. This valve has a free movement of 180 degrees on the shaft, which allows the engine to be reversed. No check valves are used. The piping between each crankcase and its neighbor's supplementary piston chamber leads also to the rotary valve.

Fuel is fed to the cylinder heads by means of a rotary throttle. The rotator A, driven by the vertical shaft, has an opening through it which always leaves one hole in the throttle B uncovered. The throttle B, controlled by a hand lever, has in its top one hole for each cylinder, which leads to two holes in its bottom, 150 degrees apart. The throttling is accomplished where the holes in B register with the pipes leading to the cylinders. With the throttle described, the engine can be reversed, and never requires a starting crank. Opening the throttle admits fuel to a cylinder that has passed firing position; the spark being passed at the same time fires the charge. After the engine has attained speed, the throttle lever is moved to the other side of the arc, and the fuel is admitted during compression. A pressure is always maintained on the fuel tank. To overcome any extra that may be due to the fuel in the longest pipes, the holes in the top of the throttle B need not be placed concentric; those leading to the farthest cylinders being nearest the center. In case this proved unreliable, a simpler throttle could be used between each pair of cylinders. This would insure an equal amount of fuel to each.

To sum up, the Carroll motor has the following advantages: No fuel is wasted in the exhaust or at the bearings; none of the burnt charge mixes with the fresh; no crank is necessary—the engine is self-starting and reversible; with the amount of air transferred, air-cooling ceases to be a problem; considerable leakage could occur at the bearings without hindering the positive action of the motor.

As throttling is accomplished by varying the amount of fuel injected, the engine always secures its figured compression, and at high speed receives a full charge, which no other does. The four-cycle cannot be compared to it, by reason of its simplicity and positive action. It will probably show more than twice the power of the same sized four-cycle.—Guy B. Carroll.



TWO SECTIONS OF THE CARROLL ENGINE

SPEED OF OIL FEED

Portsmouth, O.—Editor Motor Age—Let me know how many drops of oil per minute each cylinder of a double-opposed 4 1/8 by 5-inch horizontal engine should have.—Subscriber.

This is a matter that can only be determined exactly by experimenting a little, as different motors of the same make will frequently differ in this respect. Try eighteen to twenty drops per minute for each, in order to be certain of having sufficient. If there is much smoke in evidence, cut the quantity down until it ceases to appear. Note the quantity of oil in the crankcase before beginning the experiment, and if no sign of smoke appears with the rate given above, run the motor under average normal load for 15 minutes steadily. Then examine the quantity of oil left in the crankcase, and, if unduly diminished, or increased, regulate the supply accordingly. A well-designed motor of this size, in good condition, should run smoothly on ten to twelve drops per cylinder per minute, but it is better to go over, rather than under, the quantity, and it is quite a general practice with drivers to feed all the oil possible short of causing smoke.

NEW JERSEY IN ARMS

Newark, N. J.—Editor Motor Age—The constant attacks on motorists by our legislature, and the discourtesy shown by our state to motorists of other states, has

reached a point where it threatens to seriously affect the industry in New Jersey, and the New Jersey Automobile Trade Association in self defense is about to start a vigorous campaign for fair legislation in motor car matters. Our politicians are blind to the extent to which our state is benefited by the motor car and the great number of people who depend on it for a livelihood, for the reason that they do not see a complete car made here, but the fact is that New Jersey, more than any other state, benefits by the motor car. 1. From the fact that almost every part entering into its construction is made by our factories, including forgings, castings, bearings, springs, tires, lamps, bodies, varnish, leather, paint, electrical appliances, wire tools, jacks, machinery, wheels, axles, gas tanks, trunks, radiators, gears, etc. 2. The peculiar location of our state makes it most attractive for tourists, and great amounts of money are annually left with our hotels, summer resorts, garages and merchants generally, and the motor car has immeasurably benefited the real estate business and brought more desirable residents to the state than anything next to the railroads. In view of above facts, we propose to thoroughly organize every industry effected and are now tabulating them, also enrolling every person whose interests are effected. We are going to fight and fight hard. We will make it a paramount political issue with us and will look to parties rather than to persons for results. —New Jersey Automobile Trade Association.

WRITE SECRETARY ELLIOTT

Baltimore, Md.—Editor Motor Age—Kindly answer through the columns of the Readers' Clearing House the following questions? Where and how can I obtain an A. A. A. Year-Book? Does the Maryland motor car belong to the A. M. C. M. A. or the A. L. A. M.? Has the Maryland agencies in any of the large cities? Is there an agent for the Chalfant in Baltimore city?—Joseph B. McLaughlin.

Copies of the Year Book of the A. A. A. may be obtained by writing to Frederick H. Elliott, secretary A. A. A., 437 Fifth avenue, New York. Motor Age has no record showing that the Maryland car belongs to either A. L. A. M. or the A. M. C. M. A., or is it aware of it having agencies in any of the large cities. Regarding the Boston agent for the Chalfant car, it would be well to communicate direct with the Chalfant Gasoline Motor Car Co., Lenover, Pa.

EFFICIENCY OF AIR-COOLING

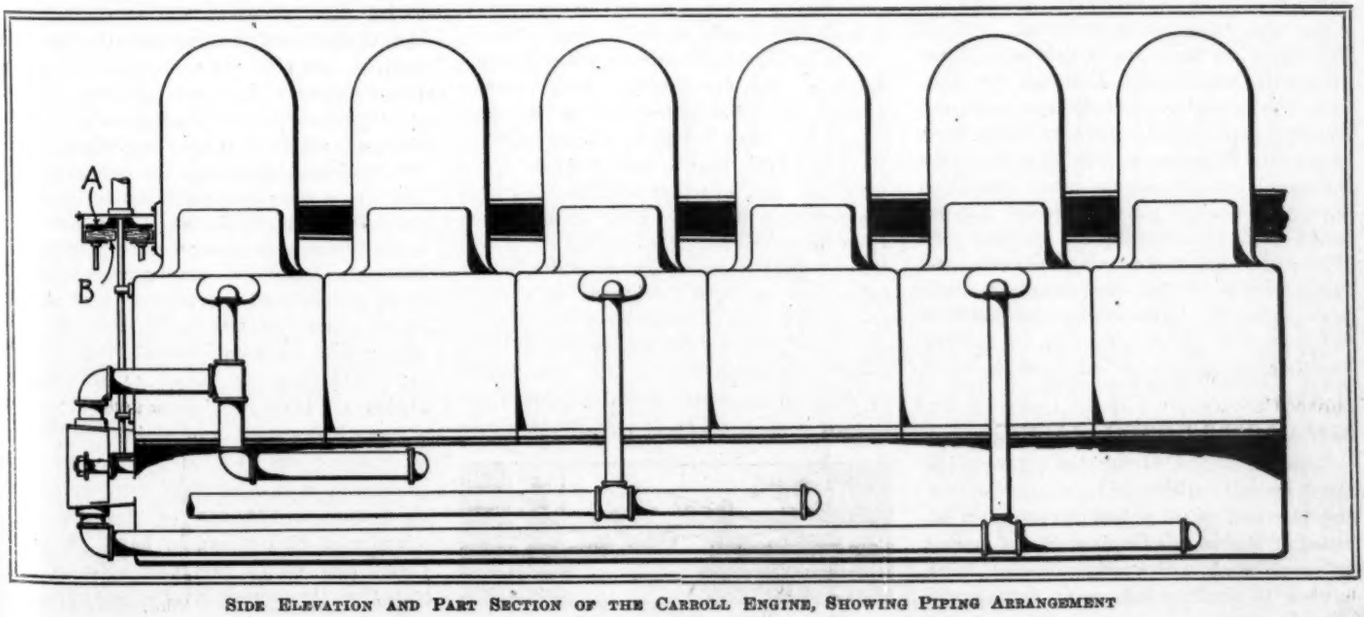
Elizabeth, Pa.—Editor Motor Age—Are there any air-cooled two-cylinder four-cycle motor car engines on the market which are as reliable and successful as the same in a water-cooled engine? In brief, is an air-cooled engine as economical or reliable and successful as a water-cooled? In your estimation would an engine air-cooled, with cylinder 5 inches in diameter by 5½-inch stroke, be as efficient as one 3½ inches in diameter by 4-inch stroke? Which size would be the more successful, or would there be any difference in the cooling effect? Is friction drive on motor cars efficient and successful? Would solid tires be successful on a motor car equipped with full elliptic springs, or would they be injurious to the car in general? Which kind would give the most and best service, a cushion or solid gum?—William McLoy.

There are quite a number of two-cylinder, air-cooled, four-cycle engines on the market, practically all of the horizontal opposed type. Some of them have been used on hundreds of cars that have seen service for several years, from which we should judge they were successful, otherwise they would have been abandoned long since. An air-cooled engine is more economical of fuel than a water-cooled type owing to its greater thermal efficiency, and for this reason it requires more lubricating oil, as it runs much hotter. The difference in lubricating oil consumption is nothing like sufficient to offset the economy in fuel. If both engines were of exactly the same design and were worked under equally favorable conditions, there should be no appreciable difference in their efficiency. Judging from the fact that, except for racing purposes, air-cooled motor car motors are seldom built to exceed 4 to 4½ inches bore, probably the smaller engine might give better service in unskilled hands and under adverse conditions, but the successful performance of larger air-cooled motors would appear to indicate that there is no reason why the dimensions in question cannot be exceeded. It is more a matter of compression than of size, as the latter would only imply an increase of volume, and the former an increase in the temperature, other things remaining the same. Judging from the number of cars equipped with a friction drive that are turned out annually, both in this country and Europe, this type of transmission would appear to be entirely practical for every-day use. It depends entirely upon the car and the service that is required of it. If excessive speed be not desired and the roads ordinarily traversed are fairly smooth, solid or cushion tires should give satisfaction. The solid rubber tire would probably give the better service. We do not believe there are any cushion tires for car use on the market today, though some of the solid tires made have a small hole running through the center.

NEW YORK-PARIS RULES

Joplin, Mo.—Editor Motor Age—Will Motor Age kindly give me the terms under which the New York to Paris race is being made.—M. T. Dreisbach.

According to G. Bourcier St. Chaffray, official director of the New York-Paris tour, and who is traveling with the de Dion car, the rules governing the run are somewhat vague in places. The general spirit of the rules is that the cars go on their own power along the highways from



SIDE ELEVATION AND PART SECTION OF THE CARROLL ENGINE, SHOWING PIPING ARRANGEMENT

New York to the Rocky mountains, where they are given permission of using flanged wheels on the railroad track for crossing the Rockies. The cars are to ship from Seattle to a point in Alaska, thence travel overland under their own power to Cape Prince of Wales. From this point, the trip across Behring strait could be made on wheels or by mounting the car on runners and using sails as a sailboat. Should the ice not be sufficiently strong, permission is given to use transports. Once in Asia, cars are supposed to go under their own power along the north shore of the continent to the mouth of the Lena river, thence southward on the ice until the terminus of the great post road of Siberia is reached. Should the ice on the Lena be broken before this post road is reached, permission is included to ship the cars by steamer, until the terminus of the post road is reached. From this point to Paris the cars travel under their own power on this road. Commissioner St. Chaffray further interpreted the rules as being a tour across the American continent and through Siberia, the object being to show how it is possible with two or three cars assisting one another to make rapid progress in the worst seasons of the year, and over practically unknown parts of Alaska and Siberia. The original rules gave the permission to each car of the contestants to ship by train from any part of America to Seattle, in order to reach that point by March 10, the date originally set for shipping the cars by boat to Alaska. The trophy offered for the race goes to the car completing the greatest distance; should none of the machines reach Paris, that approaching nearest the city will receive the prize.

USES TWO-PART FRICTION DISKS

Los Angeles, Cal.—Editor Motor Age—In the issue of March 5 Motor Age described Cook's friction transmission patent No. 879,367 and stated that the left disk is a one-piece affair which can be shifted endwise on its shaft, whereas the right disk is a two-part affair. I would say that both disks are in two parts. This transmission is designed to use the friction on the low speeds only, and when the beveled periphery of the side disks is in contact with the beveled driving wheel the flat-faced shaft-driven wheel may be moved to change the low speeds and reverse without releasing the beveled side disks; the flat disks being movable and independent of the beveled disks, they take up all the difference in wear between the two contact points; but are pinned together and rotate as one wheel.—James H. Cook.

SLIP CAUSES ENGINE RACING

London—Editor Motor Age—I have noticed several articles and paragraphs stating the engine of a motor car races because of the wheels leaping off the ground on rough roads and at high speeds. With a view to settling this point definitely I had some interesting experiments carried out at Brooklands recently. The results obtained seem to rather dispose of the idea that the engine "races." At any rate in the six-cylinder Napier car with its shaft drive system of springing and road equalizers both back wheels do not, apparently, leave the ground together. With regard to the question of the part played by the springing of the car, this is rather an important point, because some have suggested that it was impossible to construct a car with a transverse spring at the back with the luxury and comfort that accompany this without having the serious drawback of the wheels not holding comforting to the ordinary user to know this, as it means to him, not only more comfort, but a decrease in his tire bill, as any form of "racing" or unequal drive, means an early decease to the tire, and grist to the tiremaker's mill.

The test was carried out as follows: The top gear was engaged, and the car was then towed a complete lap at Brooklands, or a distance of aproximately 2⅝ miles, and the number of revolutions of the engine was found to be 3,732. The car followed the 50-foot line of the track, and throughout the whole test followed the same line as near as possible. The car was then driven at varying speeds, as given in the tabulated list:

Test	Speed in m. p. h.	Engine Revs.	Total slip in engine Revs.
1	Car towed	3,732	..
2	Driven very slow speed	3,748	16
3	Driven 20	3,776	44
4	Driven 30	3,772	40
5	Driven 40	3,770	38
6	Driven 50	3,780	58
7	Driven 60	3,804	72

Distance, 2⅝ miles in each test.

This list gives a speed up to 60 miles an hour, and as will be seen the engine made only 72 more revolutions in a complete lap at 60 miles an hour than it did when being towed. This, of course, is practically almost a negligible quantity.—S. F. Edge.

WANTED—SELF STARTER AND TIRE

Marshall, Minn.—Editor Motor Age—I am writing this at my leisure with my left hand because 3 weeks ago the starting crank of my car kicked back vicious enough to shatter both bones of my good right arm. Now, I want a simple practical starting device that is easy to operate and perfectly safe, one that will do away with the principle difficulty that deters women from using the gasoline motor car. I will suggest that a coiled spring which might be wound up by a few turns of a small crank, and then released by a foot trigger at will to give the crankshaft two or three rapid turns, would fill the bill. This might be made so the motor would automatically keep it wound, ready to restart the motor at any time by simply touching the trigger with the toe. If need be the spring could also be wound up by hand. Another thing I want is a simple alarm to indicate that the tire is deflated so I will not proceed to ruin a $75 tire before I find out it is flat. I will suggest that such a device might be made to act like a torpedo, exploding when the air pressure should get down to no resistance. A small stop cock to be turned with a screw driver could be used to prevent explosion when the tire required deflation, and these torpedoes could be replaced as easily as the loaded shell of a shotgun. I want a tire that possesses all the advantages of the pneumatic and those of a solid tire to boot. I will suggest that such a tire may be made as follows: Make rubber sections a trifle larger than the cavity of the casing, and about 6 inches long, having slanting tubular cells extending from the tread surface nearly through the section, and of such a size that the section will have about the same resistance to compression as does the pneumatic tire; the slant of the tubular air cells to be so that when the opening of a cell is in contact with the ground pressure the cell will be a closed elastic pneumatic cushion. That is, the opening of the cell must be in advance of the cell itself, so the compression will not deflate the cell before it is closed by the compression. These sections are to be placed inside the usual casing in place of the regular inner tube, filling the casing snugly; the casing then to be forced into the clincher rim by a lever tool and the usual retaining lugs screwed up. The air cells being close together forward and backward, and a thicker portion of rubber being between the cells and the sides of the casing, when the tire is under compression the yielding will be fore and aft and not outward. This will prevent side wear on the casings in two ways. The sides will not bulge, and when the casings wear thin there will not be an air pressure to push the thin part out where it will wear faster than the rest of the tire. Another feature of this tire is that on smooth roads where the speed is high, the air cells are compressed so quickly the air contents do not escape until they have passed the point of greatest resistance, and the tire is quite tight and hard, while if running slower on rough ground the air escapes gradually while the cells are under compression, and the tire is a soft tire for easy riding on the rough road. Thus we have an automatic tire which gives the required hardness for best results on smooth roads, and the softness to give easy riding on rough roads. This tire is not much heavier than the pneumatic, avoids all blow-outs, punctures, rim-cuts, side-wear, destruction of casings and tubes by running on a deflated tire, and will wear until it is completely worn out doing good service. It can be put into any clincher or Fisk casing by hand. A small cheap tool would cost but little if any more than the present inner tube, and can be

adjusted to any size wheel by simply adding sections with small adjusting pieces to put in between the sections when needed. The sections need not be made of pure expensive rubber, as they undergo but little wear. This idea of mine is now in the form of an application for a patent. Another thing I want is a small primary circuit breaker on the top of the steering wheel that shall open the circuit so when I want to coast down hill I can let the motor run as a retarder without the ignition. Another thing I want is a differential which does not act as such until the front wheels are turned a certain distance out from straight ahead. This would give me freedom from skidding, power on both wheels when one is on a slippery place, and greater ability to get out of mud holes or over icy ground. —A. D. Hard, M. D.

Editor's Note—Dr. Hard was one of the first physicians west of the Mississippi river to use a motor car in country practice, his early experiences being with the fifty-second steam mobile built by the Mobile Co. of America, Tarrytown, N. Y., in 1898 or thereabouts.

MOTOR INSTRUCTION BOOKS

Stanton, Tex.—Editor Motor Age—Please advise me as to where I can get books of instructions on engines of all kinds from electric motors to steam and gasoline engines.—J. C. McLeird.

Books containing instructions on the operation, as well as design and construction of electric, steam and gasoline engines, may be obtained by communicating with the book department of Motor Age. A few of such are: Brook's "Automobile Hand Book," "Horseless Vehicles," by Hiscox; "The Automobile," by Hasluck, and "Self-Propelled Vehicles," by Homans.

CLUB CONSTITUTIONS AND BY-LAWS

Boise, Idaho—Editor Motor Age—Kindly advise me where I can secure a copy of constitution and by-laws suitable for a small motor club of not over fifty members. I believe Motor Age has an interest in aiding the starting of such clubs—A. G. Randall.

Copies of a constitution and by-laws suitable for a motor club can undoubtedly be received by writing to organized clubs in your own, or adjoining states. If not, write to the secretary-treasurer of the Chicago Motor Club, 200 South Clinton street, Chicago, Ill., or the assistant secretary of the Chicago Automobile Club, Chicago, Ill.

BUILD GASOLINE DELIVERY CARS

Bisbee, Ariz.—Editor Motor Age—Kindly furnish me with a list of manufacturers who make gasoline delivery cars.—W. H. Brophy.

If the inquiry applies to gasoline delivery cars of 1-ton capacity or less, there are a great many concerns supplying such. A few of these are: Cadillac Motor Car Co., Motor Car Co., Covert Motor Vehicle Co., Franklin Mfg. Co., Hewitt Motor Car Co., Thomas B. Jeffrey & Co., Logan Construc-

tion Co., Maxwell-Briscoe Motor Co., Mitchell Motor Car Co., Olds Motor Works, Rapid Motor Vehicle Co., Reo Motor Car Co., Waltham Mfg. Co., Model Automobile Co. and Brush Runabout Co. There are a great many concerns building delivery wagons of 1½ and 2 tons capacity.

WEAR ON D VALVES

Le Mars, Iowa—Editor Motor Age—In the March 26 Motor Age C. F. M. covers considerable space to show, in an entirely theoretic way, that a slide valve would stick upon its seat, by using high-pressure steam when it has been clearly proven in actual practice that a well-designed, partially-balanced slide valve—as all such should be—takes but little, if any, more power than one in a piston form, both being properly lubricated as they should be. It is not a question of sticking on the seat that has been the fault of poorly designed, unbalanced D valves, but the excessive wear on the valve gear, which has induced lost motion, and so set the valve with a late admission, and a later cut-off, which from time to time gets worse, owing to the extra pressure necessitated by these conditions. If the Stanley uses a Stephenson link, no matter whether the maker has failed to make a notched quadrant, by which it could be hooked up, it would certainly be a Stephenson link just the same. Several engines which the writer has rebuilt and modernized had no notches for hooking up, especially in the back-up gear. Putting the engine to other work, requiring this gear's frequent use, it was best to notch it also where the front had but two; when the work at times was light enough to warrant it, the third and even fourth notch was cut. If a maker goes to the expense of putting on a link-reversing device he will not make use of its best feature, the variable cut-off; especially is this so in a motor car requiring, as it does, a maximum power to start or climb a hill, then run for long distances downgrade, where practically no power is required, he would be very foolish indeed to do this. In other forms of reversing devices, many of which are in use on traction engines, as the pinion reverse, the diagonal reverse and many others that cannot be hooked up, the makers have given them a travel and made the valve with lap enough to give about a three-quarter port opening and about a five-eighths cut-off, thus dividing power and economy, one might say. These reversing devices, not having the wearing parts of a link, claim this advantage, but when one has a link, why not get the advantages of it? What would a locomotive be without the variability the link gives it? In an instant it is set for starting a heavy train up-grade, steam following the piston about three-fourths of the stroke, and then again set for best results at 50 miles an hour. The engineer who would allow his locomotive to run a full valve travel, or with the lever down in the corner, as we used to say, when his grade, load and speed did not require it, would have little regard for the engine, the fireman or himself. If the grade was mild and he had a heavy train, his piston speed must naturally be low, so how, letting it run at full travel, would it wear any of the parts more than if hooked up? To hook up in a case of this kind simply means to put more pressure in the steam chest, and this is what means wear and tear on both valve and gear. It is a pity to waste space on a complicated subject like this, but I would like to see as many makers and as much brains and capital expended on steam with cars as on gasoline; then steam would be placed where it rightly belongs. With the wonderful results two or three makers of steam cars are getting, it would be a very unfair man who could not predict what could be done with steam. If a man has to contend with the extra load water makes, its extra piping, pumps, packing, leaks, replenishments, corroding, freezing—even boiling—as all water-cooled gasoline cars now have to, then put up with the treacherous and expensive electric apparatus, one might as well get in and pull the lever, and let steam do the rest, in place of winding up a balky gas motor that may not stay wound. Steam is good enough for me, but if I cannot get steam, air-cooled gas is best, for 4 years' use has proven it reliable.—C. L. V. Berg.

WANTS MORE DETAILS

Washington, D. C.—Editor Motor Age—In publishing future reports of reliability runs, hill-climbs, etc., will Motor Age kindly, for the benefit of your many readers and subscribers, publish the model of the winner as well as the make of car? Most manufacturers make one or more models in which your readers are interested, and it is Greek to them when it is said the Maxwell won in the Milwaukee test, the Cadillac wins in the hill-climbing contest, etc. Now, Motor Age readers may be interested in a certain model of a certain make, and it is an aggravation to them not to know which model wins the race or test. Please enlighten us on this subject in the future and oblige more than one old subscriber.—P. L. Bush.

This matter will receive attention.

SECRETARY OF O. M. L.

Duluth, Minn.—Editor Motor Age—Please inform me how I can get the name and address of the secretary of the Ontario Motor League.—H. H. Gilbert.

The name and address of the secretary of the Ontario Motor League can be obtained by communicating with R. M. Jaffray, care Toronto Automobile Club, Toronto, Can.

SPRING SUSPENSION IN MOTOR CARS

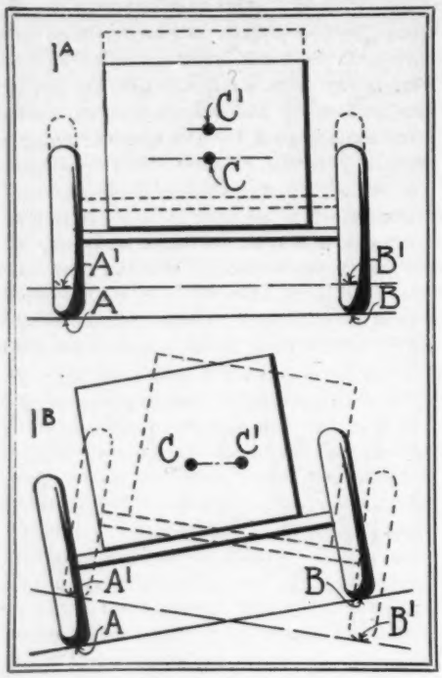


FIGURE 1

THE headings under which the present paper is thus arranged are as follows:

1—Suspension: (a) "Side location." (b) Suspension period. (c) Suspension oscillation; damping.

2—Dynamical effects in control mechanism: (a) Dynamical considerations relating to steering. (b) Dynamical considerations relating to clutch and brake.

3—Worm driving and screw propulsion.

4—Gyroscopic effects: (a) The principle of the gyroscope. (b) Torque due to the motor flywheel. (c) Other gyroscopic effects.

Suspension of Car Bodies

(a) Side location—It is instructive to examine briefly the oscillations and forces that arise when an unsuspended vehicle is drawn over an uneven surface. Let figure 1 represent an example, in which A and B represent the points of contact between the road wheels and the road, and C the center of gravity. Then as the vehicle passes over an uneven road the point C is both lifted up and down—figure 1A—and thrown from side to side—figure 1B; these motions, shown separate in the two figures, may in reality take place either individually or simultaneously. The vertical range of the displacement of C depends implicitly upon the road contour, but the lateral displacement depends in part upon the road contour and in part upon the height of the center of gravity C above the road surface. Thus, in figure 2A, where C is kept low, the lateral motion is small, whereas in figure 2B, where the height of C above the ground is large —purposely shown exaggerated—the lateral motion is great; at the outset, therefore, we appreciate the importance of a low center of gravity.

EDITOR'S NOTE—Paper read by F. W. Lanchester on Wednesday, March 11, 1908, before the Institution of Automobile Engineers, at the Institution of Mechanical Engineers, Storey's Gate, S. W. England—Part I.

At this juncture attention may be drawn to a point of much importance, and one that is often neglected. If the tires of the vehicle were smooth so as to offer no resistance to lateral sliding on the road surface, the center of gravity of the vehicle, instead of being thrown bodily sidewise at each change of lateral gradient, as illustrated in figures 2A and B, will not undergo any lateral displacement whatever, for a lateral displacement involves a lateral applied force, and if the tires are frictionless no such force can exist; hence under these supposed circumstances the motion of the vehicle in passing over changes of lateral inclination will be of the form represented in figure 3—the road wheels will wriggle sidewise as they travel along the road. This brings into prominence the fact that the lateral motion imparted to the car in figures 2A and B causes a lateral reaction on the tires, resulting in stresses of a most destructive kind, the conditions being comparable to those that obtain in a zigzag race. The magnitude of the lateral reaction for given speed and road conditions varies with the amplitude of the lateral motion; that is to say, it is proportional to the height of the center of gravity above the ground.

The function of a suspension is in its essence to permit of the road wheels following the road surface without the rising and falling and oscillating motions being conveyed to the body. In considering the behavior of a suspension it is sometimes necessary to regard the road wheels and underframes as fixed and the body as oscillating; but it is, generally speaking, more correct to look upon the body of the car as stationary and the motion as confined to the underframes, as would be the case were a perfect suspension possible.

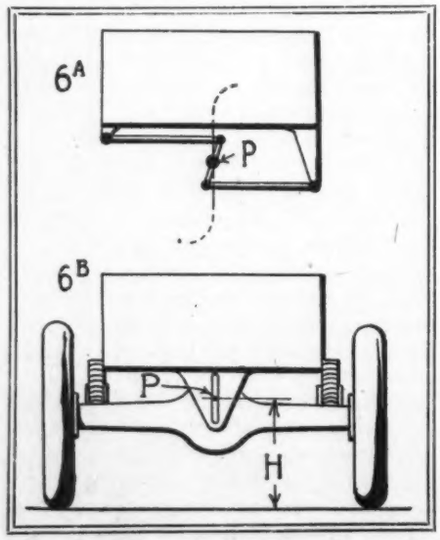
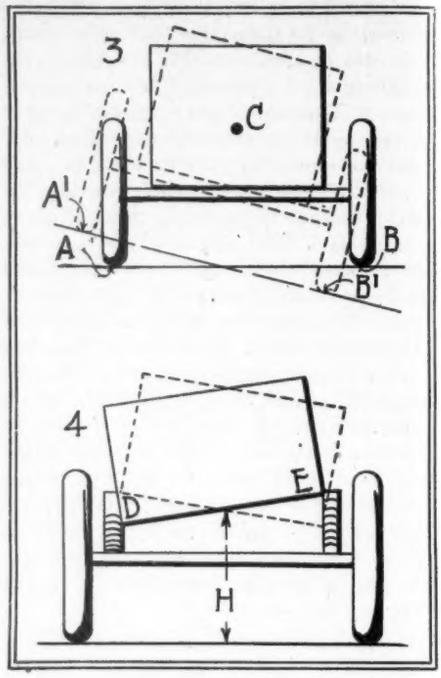


FIGURE 6



FIGURES 3 AND 4

In the forms of suspension in common employment the elastic connection between the car body and the underframe consists of a combination of springs of the laminated type, giving a considerable range of freedom in a vertical direction, but a comparatively small range of freedom laterally. The lateral freedom is, in fact, so small that the customary type of spring may be said to provide a more or less definite side location. Thus in figure 4 the motion of the points D and E is approximately vertical, and these points may be said to provide the side location for the car body; in this figure, H represents the height of the side location above the ground level.

Now, as the car travels over a surface of changing lateral inclination, the points D and E are constrained to oscillate laterally, so that the body also receives a sidewise vibration or oscillation that the springs are powerless to intercept. Counterpart to this the tires are "hustled" by alternate lateral stresses, in the manner described in considering the unsuspended vehicle.

In the practice, owing in part to the slight degree of lateral flexibility of the springs—which may amount to some ½ inch or so—and in part to the freedom permitted by the "shackling" of the springs in some cases, the side location is not so rigid as to enforce the whole of the lateral motion on the body, as shown in the diagram; but, in any case, the quantity H, that is to say, the height of the side location above the ground level, should be kept as small as possible, for, other things being equal, the amplitude of the side wobble will be proportional to H.

It is evident that the correct position

for the side location is, theoretically speaking, on the ground line itself; thus, in figure 5, we will suppose that the body is carried on a cantilever suspension of the Lanchester type, exaggerated to the extent of carrying the axle down to within an inch or so of the ground, it is evident that no side oscillation will be conveyed to the body, and the wear and tear on the tires will be correspondingly diminished.

In designing suspension mechanism, I have for the past 10 years had the considerations now under discussion in view, but I have never gone to the length of lowering the point of side location to the extent illustrated in figure 5; such an extreme would scarcely be justified in view of the fact that any small side throw can well be taken by the lateral elasticity of the springs combined with a slight yielding of the tires. It is evident, however, that any increase of H above some critical value will begin to cause discomfort to the passengers and damage to the tire fabric.

In one of the cars at present on the market the side location is defined absolutely by the employment of a Watt's parallel motion. A mechanism consisting of the usual three bar linkage—figure 6A—is attached to the chassis members, the two side links, or tie links, are of equal length, and thus the center point P of the coupling link has an approximately straight line motion of fixed direction relatively to the car body; a pin articulating at the point P is fixed on the underframe. This mechanism is obviously the equivalent of a "horn plate" figure 6B attached to the car body and locating off a pin on the underframe; it evidently

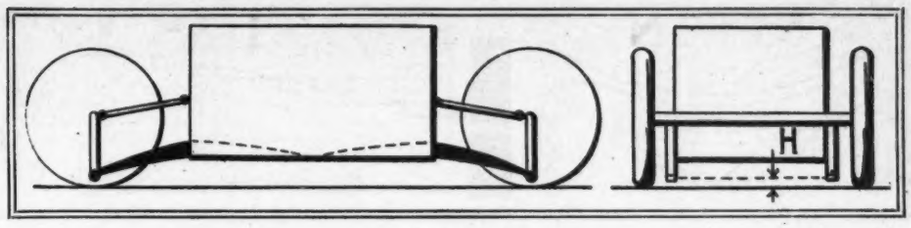


FIGURE 5

gives a rigid side location of height H —see figure—and cannot in any way improve the comfort of the car or add to the life of the tires.

(b) Suspension period—The criterion of the "softness" or "hardness" of a suspension is the suspension period; the quicker the period the harder the suspension, and vice versa.

If there were no practical limitations to the period attainable, the slower the period the greater the comfort; it is, therefore, the object of the designer to obtain as slow a period as is compatible with the other conditions.

It can be shown from theoretical considerations that the period of any given suspension is the same as that of a pendulum whose length is equal to the linear deflection of the springs under load; thus, if we suppose that the weight of a car body be entirely removed from the springs by raising it on a crane, so that the weight is just, and only just, relieved, then if l be the height through which the body has been raised, the time period will be that of a pendulum of length = l. The equation from which the period of a single or half oscillation can be calculated is therefore the well known expression,

$$t = \pi\sqrt{\frac{l}{g}}$$

, where t is in seconds and l in feet. As a matter of convenience, I have given in a table the period in complete double swings per minute corresponding to values of l expressed in inches.

Number of oscillations per minute for initial spring deflection = l.

l Inches.	Complete oscillations per min.
1	188
1.5	153
2	133
2.5	120
3	108
4	94
5	83
6	77

Now it is evident that if an attempt is made to obtain the maximum degree of comfort possible a limit is very soon reached, for a suspension range exceeding a foot is scarcely permissible, and since the range above and below the normal position should be about equal, this means that the equivalent pendulum length is 6 inches, and the number of complete oscillations per minute = 77. In general, this is beyond that which is attainable, though I have sometimes nearly reached this figure; 5 inches is the most it is usually possible to specify, with a corresponding period of 81. I have found in practice that a period slower than 90 per minute gives an ample degree of comfort, whereas a period quicker than 100, although frequently employed, should be avoided when circumstances permit of such.

One great advantage to the designer in working to the oscillation period is that he can at once calculate the change of camber under load, and he can specify this when ordering from the spring maker. Thus his order might read, when he has designed for a period = 83: " . . . camber without load—say 6 inches—and under load of 10 hundredweight—the load intended to be carried—to depress the 1-inch camber, etc. . . ." This throws the onus of deciding the proper sub-division of the steel, that is, the number of laminæ, on to the spring maker—a responsibility he should rightly bear. The designer of the car must see that the overall drawings supplied to the spring maker permit of the spring being made a satisfactory job. The condition that must be

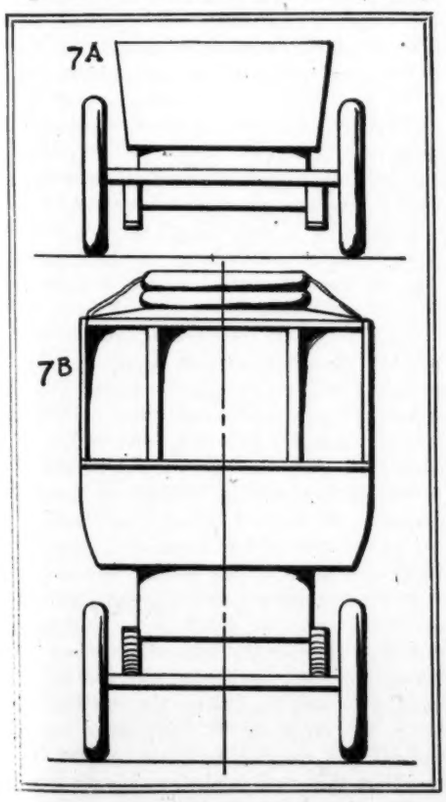


FIGURE 2

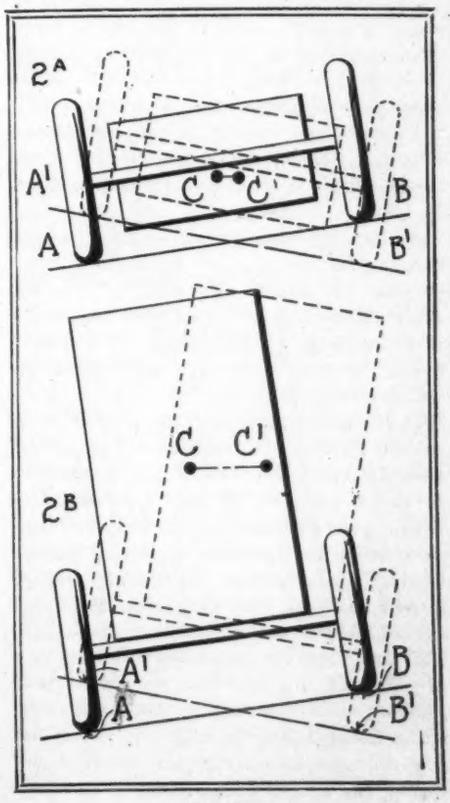
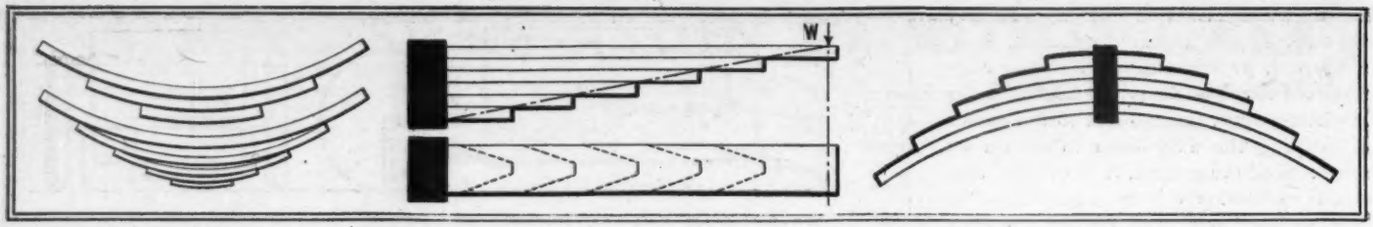


FIGURE 7



FIGURES 9 AND 10 FIGURE 8 FIGURE 11

complied with is that there shall be a sufficient weight of steel for the storage of the energy required. If this weight is insufficient, no skill on the part of the spring maker will save the situation. It is absolutely necessary that for each foot pound of energy stored by the spring under load there should be a certain minimum weight of steel in the spring. We do not know in some cases exactly how much energy the springs have to take up, but we must always assume some value. If we take as basis the energy normally in the springs when the car is at rest, not more than 5 foot pounds of energy must under any circumstances be stored in each 1 pound of steel. It is better to allow 1 pound of steel for every 3 or 4 foot pounds of energy. The energy to be stored on this basis is the weight of the suspended portion of the car multiplied by half the deflection—that is, $\times \frac{1}{2}$, 1 being expressed in feet. When the car is in motion the definition of the springs is at times greater than when at rest, so that the actual duty the springs have to perform is far more than indicated by the above figures.

In testing the period of the springing of a car it is only necessary for two or three men, standing on the car body or chassis, to keep up a periodic movement to fit in approximately with the natural period, while an observer counts the oscillations against time. It is desirable that the car being examined should be loaded to about its average capacity.

Besides the main period, namely, that of vertical oscillation, there are other natural periods, due to the springing, of a somewhat different kind. The most important of these is the rolling period. I will now briefly discuss the main conditions on which this depends.

If, instead of testing the period of a car by applying a "stimulus" in a vertical direction in or about the center line of the chassis, or at least symmetrically with regard to same, the car body be made to oscillate by alternate horizontal pushes and pulls planted with regular periodicity, it will be found that in general the natural oscillation has a different frequency. The motion under these conditions is one of "rolling"; the whole suspended portion of the vehicle has a rotational oscillation about a longitudinal axis. Now for a given weight of car and strength of spring, the rolling oscillation will be slower as the moment of inertia about the axis of oscillation is greater, in the proportion of the square root of the latter; it will further be slower as the lateral "spring base" is made less again in the ratio of the square root. Thus in figure 7, A represents in end elevation a disposition that results in a short rolling period, and B is typical of an arrangement in which the rolling period will be excessive.

Now in the case of rolling it is undesirable that the period should be too slow. The same probably applies in the case of the "bouncing" period—I refer to the vertical oscillation period as the bouncing period to distinguish it from the rolling and other oscillation periods—but the limit is in this case beyond that which is easy to obtain, hence the point is not one that is liable to arise. In the case of the rolling period, however, it is quite possible to go beyond the limit that is desirable; a car will then roll in a disagreeable manner, and in turning corners will be liable to an unpleasant amount of heel. For this reason excessive top hamper is very objectionable, and as such it should be just that necessary for weather protection. The carrying of luggage on the roof, sometimes insisted on by inexperienced purchasers, should be discouraged by every possible means.

The whole question of the rolling oscillation and of the couple or torque by which it is set up is a subject of greater complication than at first sight appears, and only the most brief outline can be given in the present paper.

The moment of inertia about the axis of oscillation may be looked upon as the sum of two parts—the moment of inertia of the chassis and body about its own center of gravity, and the moment of inertia of the body as a whole, supposed concentrated at its center of gravity, about the axis of oscillation. Now, the first of these is settled once and for all by the body and chassis design, and cannot be altered; the second, however, depends upon the distance of the point of side location from the center of gravity of the suspended mass; this is a quantity that the designer can vary. Thus by raising or lowering the body and chassis as a whole the second part of the moment of inertia can be made greater or less, or by altering the height of the point of side location above the ground level similarly an alteration may be made. If, as is frequently the case in a limousine type, the period tends to be too slow, we thus find the designer in a dilemma; he cannot lower the body and chassis as a whole past a certain limit owing to the underneath clearance necessary; he cannot raise the point of side location without detriment to the perfection of his suspension both as touching the comfort of the passengers and the wear on the tires. His only recourse is to either stiffen the springs, which quickens the bouncing period and decreases the comfort, or he must widen the lateral spring base—a procedure that cannot be carried beyond a very moderate degree unless the wheel gauge is to be involved. For the above reasons the design of a large, heavy car with much top hamper is frequently a matter of compromise, and the success or otherwise of any given machine will largely depend upon the intelligence of the driver. If the comfort of the suspension alone is considered in design, a car of this type must be slowed very considerably when rounding corners; if, on the other hand, the rolling period be shortened at the expense of a shortened bouncing period, then a certain amount of discomfort is inevitable when traveling over a bad road.

There is one important lesson to be learned, however; that is, the value in any case of a low center of gravity. If the center of gravity is kept as low as possible by legitimate means in the design of the chassis and bodywork and in the adaptation of the one to the other, the difficulties mentioned are minimized, and a car may be produced with general all-round virtues not otherwise obtainable. It is worthy of note that it is one of the greatest advantages of the combination of a short-stroke engine and worm drive that it permits of engine, gear box, and bodywork being placed nearer to the ground than in the long-stroke engine and bevel drive combination.

(c) Suspension oscillation; damping—When a car passes over a culvert or other obstruction the suspension oscillation sometimes persists for several "periods" afterward, and if a further obstruction, or merely an unevenness of the road surface, occurs during this continued oscillation, fitting in with its phase, the amplitude is liable to cumulative increase. Thus if there be a more or less regular undulation of the road surface that happens, at the particular speed at which a car is traveling, to fit in with the natural period of its suspension, the amplitude may easily become sufficient to injure the springs or bring some ugly shocks on to the "check buffers"—if any. The only means of avoiding this evil, which is due to synchronization, is to provide some powerful

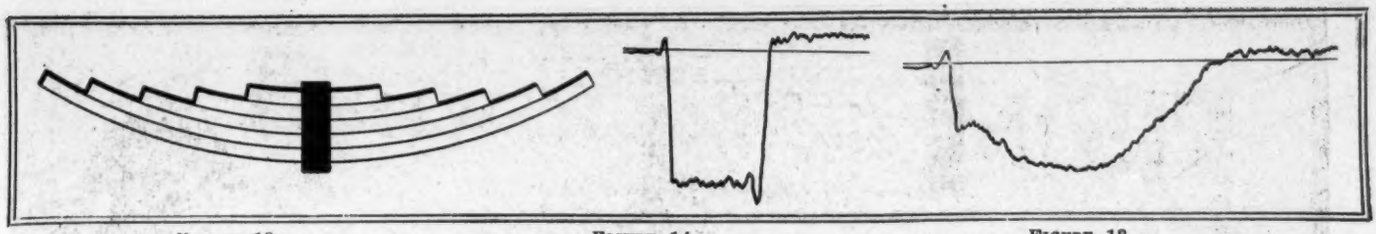


FIGURE 12 FIGURE 14 FIGURE 13

means of damping the oscillations as rapidly as they arise.

It is one of the virtues of the ordinary laminated carriage spring that it possesses to a considerable degree the necessary damping qualities in its own internal friction. When a laminated spring is flexed it is part of the action of such a spring that its constituent elements—plates—slide over one another, and considerable friction results. This friction may be actual solid friction if the spring is not lubricated, or it may be viscous friction if the plates are well greased. In practice the friction is usually of a mixed kind, in part due to solid friction and in part due to the viscosity of some kind of lubricant. It is the custom of the coach trade to lubricate carriage springs with paint. Afterward, however, if a spring squeaks it is usually greased.

It is evident that for a given spring motion the energy dissipated, that is, energy converted into heat, is related to the pressure reaction between its component plates; if these plates, from the design of the spring, are pressing hard one on the other, the friction will be greater than will be the case if the pressure between the plates is deficient or, in the limit, absent, as may occur when a spring is under negative load. It should, therefore, be an object of the spring-maker to design his springs so that the plates always press against one another.

Let us examine the "classic" method of design for the laminated spring. Firstly, since the bending moment is proportional to the distance from the point of application of the load figure 8 and the strength is proportional to the number of plates, the number of plates must be proportioned to the distance from the end of the spring, so that, as shown in the figure, the plates form a series of evenly-placed steps. Secondly, assuming the maximum load condition to be that when the plates of the spring are straight the condition that the plates shall be subject to equal stress is fulfilled when the plates are initially all of equal radius. This is obvious; if a plate is bent to change its radius from some stated value to some other stated value, its stress is in no way dependent upon its length.

When a number of plates of identical radius are "nested" to form a spring they do not fit exactly, for the external curve of the one bears on the internal curve of its neighbor—figure 9. Under these conditions, when the plates are pulled together by the buckle they bear firmly one on the other, and set up considerable friction, having the required damping effect when the spring is at work.

Now if, still supposing the spring to be designed for zero camber at maximum load, we construct the spring of plates of different thicknesses, then the correct initial form for such plates will be such that the radius of curvature varies as the thickness, so that if we make the shorter plates thinner than the longer ones, the shorter plates will also be of less radius of curvature as represented in figure 10, and the pressure between the plates when pulled together by the buckle will be greater than when plates of equal thickness are employed.

From the above it would appear that by designing a laminar spring with the plates of different thickness so that the shorter plates are the thinner, the damping factor of the spring can be improved. In the case when a spring is under negative load so that the plates are on the point of separating, the damping action vanishes. It will be noted that this point is reached sooner when the spring is designed of plates of equal thickness than is the case if they are graded in the manner above specified. It must be understood, however, that it is not the difference in the thickness of the plates in itself that is important, but rather the consequent modification in the design. It would be quite possible to obtain a similar effect with plates of equal thickness by giving more curvature to the shorter plates, but if this were done the shorter plates would be disproportionately stressed, and would in use be the first to fail.

The modification of the problem that results if the condition of zero camber at maximum stress be departed from is not a matter of great difficulty, and may easily be worked out for any given conditions; one special case may be mentioned. Let us suppose that the maximum load reverses the camber, so that the positive curvature of the top leaf without load is equal to the negative curvature with load figure 11. Then if the plates be of equal thickness, the conditions of all plates being stressed to the same degree at maximum load require that the plates should fit when initially "nested," the buckle thus having no duty so long as the spring is not under load. It is therefore evident that the damping action will vanish sooner than in the previous case; hence from the present point of view springs with a good full camber, such as will at no time have "negative camber," are desirable.

LEGAL LIGHTS AND SIDE LIGHTS

Stops Scorching on Panama

Reckless driving in the Panama canal zone is prohibited in an order issued by President Roosevelt. This ordinance provides that any person driving a motor car exceeding 15 miles an hour on straight road or exceeding 8 miles an hour when approaching curves, forks or cross roads is to be punished by a fine of not less than $5 or more than $100, or by imprisonment for not exceeding 30 days, or both.

Made Immune by Flags

By flying two Red Cross flags from the touring car in which he was conveying his invalid mother from Antrim, N. H., to the family home in Norwell, W. A. Hitchcock, banker and broker, went 125 miles under complete immunity from the speed laws, even in localities where the authorities are very vigilant in this respect. All along the way the flags were treated with respect, drivers of other vehicles courteously turning out and giving the motor car the right of way. Now the question is, did the banker unwittingly establish a dangerous precedent? While he himself did not overspeed or have any intentions of doing so, will not those motorists whose fondest aim in life is to chug over something or somebody else abuse this new idea, cover their cars with Red Cross flags and under their protection hit up the pace and the pike to their hearts' content?

Will Talk Motor Law

At the annual meeting of the Pennsylvania Motor Federation at Lancaster Saturday the principal business to be transacted will be the drafting of a new bill to be introduced at the next session of the Keystone State legislature. It is understood an effort will be made to make the new measure conform in almost every particular with what the New York and Massachusetts motorists are aiming for. In the absence of a national law, state regulations as nearly uniform as possible are believed to be the most desirable substitute. The excellent bill framed and presented by the federation at the last session fell owing to lack of time to pass it, scores of measures, of greater or less merit, being slaughtered on the last day of the session in the same way, the good roads bill being among them.

C. J. Glidden En Tour—At Pompey's Pillar and Before the Sphinx

New Club at Saratoga—The Saratoga Automobile Club, of Saratoga Springs, N. Y., has been organized with thirty charter members. Clarence R. Kilmer has been elected president and Edward R. Ashton vice president. Arrangements are being made for suitable headquarters.

Says No Scorching—Chief of Police Martin L. Cadin, of Syracuse, has sent a letter to the Automobile Club of Syracuse outlining his policy as to speed violations. The chief says that while heretofore the campaign has been mostly of an educational character, this year strenuous measures will be taken by the department to enforce to the letter the speed ordinances. Every officer will be instructed to arrest all violators.

Tire Prizes Offered—Cash prizes for the Briarcliff are offered by the makers of Continental and Michelin tires. The Michelin will pay the following cash prizes to car manufacturers in case its tires are used: To the winning car, $500; second, $350; third, $200; fourth, $150; fifth, $75. In addition to these amounts the Michelin company will also pay to the drivers of these cars the following amounts: First, $500; second, $350; third, $200; fourth, $150; fifth, $75. The Continental Caoutchouc Co. has made an offer of $1,000 in prizes for the event.

Old Arks Must Go—For many years several dilapidated horse-drawn omnibuses have been in operation in Wilkes-Barre, Pa., in those sections of the city which are not well covered by the local trolley lines. These ancient arks have been run on South Franklin and South River streets so long they have become an eyesore to everybody, and the announcement that a line of gasoline buses would soon be established on those streets was greeted with delight by those who have the interests of the Diamond City at heart. Three local capitalists—Charles N. Loveland, John Flannigan and T. A. Wright—recently organized the company which will operate the new line and they announce they will put two of the vehicles at work within a very short time. The buses will have accommodations for sixteen passengers each, will be lighted with acetylene or electric lamps and heated in winter.

Starting Early—Cleveland, as usual, will be well represented at the Vanderbilt cup race by a party traveling in a special car or possibly a special train. Secretary Forbes, of the Cleveland Automobile Club, is at work already making up the party, and he says all the members of the former party have promised to participate, while many more are expected. The members will live in the special car throughout the trip to the cup race.

Hoosiers Are Aroused—Road building in Indiana during 1908 undoubtedly will exceed that of 1907, which was a record-breaking year. In Hamilton county alone, of which Noblesville is the county seat, bids are now being asked for the construction of forty new roads which will cost about $160,000. They will be built under the new gravel road law, which compels the commissioners to build a road not more than 3 miles long, where it will connect at each end with an improved road, on the petition of fifty residents of the county. About $8,000,000 will be spent in Indiana this year for new roads.

Sale of First Winton—Ten years ago March 24 the Winton Motor Carriage Co. made its first sale of a motor carriage, and the sale was traceable directly to an advertisement. On that day Robert Allison, a mechanical engineer of Port Carbon, Pa., being assured a machine could be ready for shipment within a week, signed his name to an order and became the first American purchaser of an American-made, standard model, self-propelled road wagon, so the Winton people claim. H. C. Sargeant, of Westfield, N. J., also a mechanical engineer, and a friend of Allison's, followed his lead, buying car No. 2. Thus on its first day of actual business, the Winton company sold two machines. The first batch of cars consisted of four machines, one of which Mr. Winton himself used. Only one of the four now remained, and this car was bought by John Moody, a manufacturer of Hamilton, Ont. This sale, made 2 days after the Allison and Sargeant deals, completed the output.

City Fathers Miserly—The Buffalo board of aldermen has cut out an allowance formerly set aside to pay for a motor car for Superintendent of Police Regan, of that city. The allowance for a car for Assistant Fire Chief Murphy was considerably reduced. Chief Regan insists on having a machine and explains that it would be a great advantage to him in case of emergencies.

Glidden's Travels—Charles J. Glidden will drive from Jerusalem to the Sea of Galilee, via Joppa and Haifa, returning to Haifa and sending the car by train to Damascus—176 miles—driving to several places out of Damascus and finally reaching Beirut via Balbec. The next country will be Greece, followed by Montenegro, Dalmatia, Croatia to Trieste, crossing the Dolomites and reaching Paris early in May and London about May 15.

Farmers Not Hostile—G. B. Sharpe, publicity manager for the Studebaker, declares the farmers are not hostile to motoring. Said Mr. Sharpe: "The farmers in Indiana helped us dig through snowdrifts in the New York-Leavenworth run and brought their horses out to assist us through drifted roads, where ordinarily a farmer would not think of asking his horses to go. Considering the service rendered, I believe their charges were not exorbitant. Furthermore, many of them exhibited an enthusiasm that was, to say the least, cheering to our tired drivers and crew. All along the line our drivers reported the same kind of treatment, and nowhere were they more enthusiastically welcomed than in the great farming state of Kansas. I believe that almost invariably if the motorist will regard the farmer as a friend instead of an enemy and

accord him the gentlemanly treatment which is his due the farmer will be only too glad to meet the motorist on the same footing."

Hartford Gasoline Convert—The board of contract and supply of the city of Hartford has advertised for bids for the construction of a four-cylinder gasoline ambulance which is to substitute the present Columbia electric vehicle which has been used constantly for the past 8 years. A gasoline car was decided upon owing to the success of the Pope-Hartford gasoline ambulance which went into service last September.

Enthusiastic Woman Motorist—Mrs. Joseph J. Martin, president of the Quaker City Ladies' Motor Club, leaves nothing to chance. Preparatory to outlining the list of club run fixtures for the coming season she is making personal trips to each of the objective points she contemplates including in the itinerary. During the past fortnight each pleasant day has found her in her car en route to some one of the resorts within easy driving distance of Philadelphia. By this method she arranges the preliminaries for each outing, and avoids the possibility of a mix-up, which might otherwise occur if the arrangements were made by mail.

On the Right Track—The Cleveland Chauffeurs' Automobile Club, of Cleveland, gave a pleasant smoker and entertainment recently. A lecture was given during the evening by J. A. Williams, of the K. W. Ignition Co., on the subject of ignition as applied to motor car engines which was well received.

Preaches Good Roads Spirit—The Beloit Automobile Club, of Beloit, Wis., is now infused with a good roads spirit, as the result of a lecture by Prof. W. H. Hotchkiss, department of geology, at the University of Wisconsin, and director of the Wisconsin geological survey. Mr. Hotchkiss reviewed the good roads movement from the standpoint of the motorist, the business man and the farmer. He said in part: "Two results must be obtained before good roads can be expected. First, public sentiment must be aroused in those who want good roads; second, and this is the prime necessity, the assistance of the farmer must also be forthcoming." Mr. Hotchkiss dwelt on the necessity of the motorists avoiding antagonizing the farmer. The Evansville and Janesville clubs had large delegations to hear the lecture.

Road Record Smashed—Jack Lewis, of the firm of Lewis & Linn, motor car dealers of Buffalo, recently established a record between Buffalo and Rochester, N. Y. In his American roadster Lewis made the trip in 2 hours 3 minutes, the previous record having been 2 hours 15 minutes. The roads were not in good condition during the run.

Franklins Are Numerous—Reports just received by the H. H. Franklin Mfg. Co., giving the official list of owners in the state of Washington, show that the Franklin leads all others in the number in use in Washington. There are 186 Franklins in the state. The Reo comes second with 92 and the Ford third with 84. The Franklin has been found to be particularly well adapted to conditions in Washington, where the roads are very hilly and in the summer time very dusty.

NEWS FROM THE MOTOR CLUBS OF THE COUNTRY

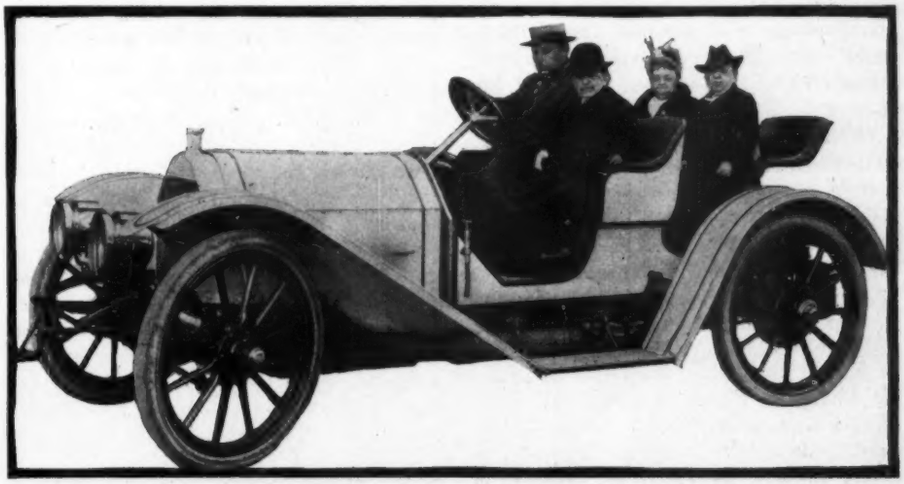
A. C. A. in the Trade—An example for the clubs of the country that want to recoup their finances has been set by the Automobile Club of America, which has gone into business as a dealer in accessories, selling supplies to members at cut prices. This move has not as yet added perceptibly to the popularity of the club among the regular tradesmen.

New Club for Gotham—A new motor club in New York city will be one immediate result of the Automobile Club of America dropping out of the national field by resigning from the American Automobile Association. It is through the A. A. A. that the clubs of the country hold intercourse and as the matter stands now New Yorkers have no way of making entries for the Glidden touring contest, as an entry must be made through an A. A. A. club and the A. C. A. is no longer such. There is a probability of the new club in the metropolis having for its president S. A. Miles, the general manager of the National Association of Automobile Manufacturers.

Stands By Its Members—The directors of the Automobile Club of Kansas City at a special meeting authorized the payment of the following rewards: One hundred dollars will be paid for the arrest and conviction of anyone stealing a motor car belonging to a member of the club. From $10 to $25, depending on the value of the article stolen, will be paid for the arrest and conviction of anyone stealing any lamp, robe or any part of a motor car belonging to a member of the club. A reward of $25 will be paid for the arrest and conviction of anyone cutting or maliciously injuring the tires of a motor car belonging to a member of the club. A reward of $10 will be paid for the arrest and conviction of anyone throwing stones or other missiles at the occupants or car of a member of the club.

Another Club Election—At the annual meeting of the Lancaster Automobile Club of Lancaster, Pa., the following officers were elected: Dr. S. T. Davis, president; Martin Kimports, vice-president; Jacob Drider, secretary; Dr. P. P. Breneman, treasurer; H. M. Hillegas, Dr. J. F. Trexler and H. C. Shock, directors. The membership now is approaching the 150 mark, and a movement is on foot to rent, buy or build a suitable clubhouse, the organization having become too large to meet at the local hotels, as is the present custom. The club has decided to join hands with the horsemen in furthering the good roads movement, and to continue its work of signboarding all the main roads in Lancaster county.

A. C. A. Ticket—The following ticket for officers and governors to be voted on at the annual meeting of the Automobile Club of America, April 14, has been named by the board of governors: President, Judge E. H. Gary; vice-president, Henry Sanderson; second vice-president, William G. McAdoo; treasurer, Edgar L. Marston; governors, Commodore Cornelius Vanderbilt, General Horace Porter, Frederick D. Underwood, William Pierson Hamilton, Waldron Williams, Colgate Hoyt, Dr. Schuyler Skaats Wheeler. The governors who still remain in office are: Winthrop E. Scarritt, Dave Hennen Morris, Colonel John Jacob Astor, George F. Chamberlin and Albert R. Shattuck.



FORMER MRS. TOM THUMB AND HER PRESENT HUSBAND IN IMPERIAL ROADSTER

MOTOR CAR DEVELOPMENT

FORTY-HORSEPOWER, MODEL B, STUDEBAKER WITH SEVEN-PASSENGER ACCOMMODATION

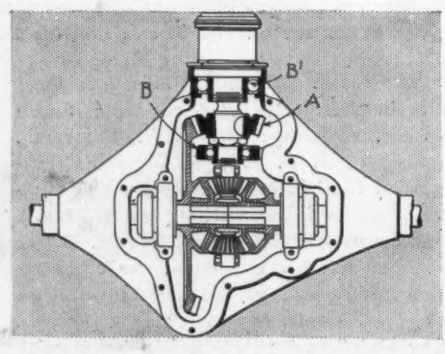
1908 Studebaker

STUDEBAKER cars for this year are in three models: H and A, 30-horsepower each and fitted with five-passenger bodies, and model B, 40-horsepower seven-passenger. The B is the leader for this season.

Historically speaking, H is the oldest model, dating back to 1905, since which time it has been going through that annual evolution which has been common to all motor cars during the last 5 years. A is a new edition of model H and is identical with it, except it uses a rear platform spring instead of semi-elliptics, employs an equalizer for the application of the rear wheel brakes and uses a pair of strut rods extending from the rear axle casing to the side members of the frame which is intended to take the driving thrust off the rear springs. Model H has none of these.

But it is the Studebaker model B, the 40-horsepower car, to which attention is invited and according to workmanship, design and finish of which the status of the Studebaker of 1908 must be gauged. This car, while a disciple in many respects of the pioneer H and its younger brother A, carries not a few improvements which are the talking points of our 1908 leaders. A few of these appear on the surface—a glance at the chassis illustration revealing them. Conspicuous is the rear platform spring, with its transverse member supporting the frame through an extension bracket on the rear crosspiece; equally noticeable is the employment of internal and external brakes on the rear wheel drums, the application of each set being through a long folded sheet-steel equalizer, lying transverse of the frame and working in slots in the side members. The ends of the equalizers extend sufficiently beyond the frame to allow straight linkages from them to the brake arms; further, not to be overlooked, is the employment of detachable heads for the waterjackets in the form of a large oval plate for each twin cylinder casting; last, but not least, notice is directed to the employment for the first time by this company of a selective gearset, offering four forward variations with direct drive on the third and high speed on the fourth. It is scarcely necessary to remark that the make-and-break ignition is employed, as it is on models A and H, and that the cone clutch remains.

Having briefly noted these "high spots" of Studebaker motor car architecture, a brief analysis of the parts that are more conventional will be in place. The motor, with its 4¾, 5¼-inch cylinders, is designed to operate at a speed of 1,000 revolutions per minute with a cold compression of 70 pounds per square inch, under which conditions it produces its rated 40 horsepower, although, according to A. L. A. M. rating, it figures at 36.1 horsepower. A pronounced symmetry is obtained by casting the cylinders in pairs with opposite valve chambers, the intakes located on the right; and carrying the make-and-break igniters in the openings in the top of the intake chambers, where they are accessible, readily removed and out of the way of other motor parts. Located on the right side are the carbureter and magneto, while oppositely placed are the shaft-driven water pump and the exhaust manifold. The crankcase is a conventional design of the two-part type, the lower or base portion serving as an oil pan and divided into a compartment for each cylinder pair, the depth of the oil within which is regulated by the six-lead mechanical oiler.



STUDEBAKER'S DIFFERENTIAL, MADE WITHOUT THRUST BEARINGS

Of the internal moving parts of the motor, it might be noted: the crankshaft with its crankpins and bearings, all made 1⅛ inch in diameter, is ground; the marine type lower ends of the connecting rods are bushed with Parsons' white bronze and held in place by two bolts with castle nuts and split pins; the upper ends of the rods are hardened and lapped to fit the hardened wristpins, no bushing whatever being used; the top also has a V-shaped grooved oil catcher intended to be filled from the splash and serving as a lubricator of the wristpin in that it is anchored by setscrew at each end to the piston bosses: the piston pin is a hollow tool-steel member, hardened and ground and made with three diameters, 1 inch, 1⅛ inch and 1$\frac{1}{16}$ inch, and in order to accommodate this pin the piston bosses or hubs are bored in two diameters of 1 inch and 1⅛ inch; pistons are made to carry four eccentric lapped-jointed rings above the wristpin and have five circular grooves beneath it for the distribution of oil, in addition to which it might be mentioned that the piston heads are slightly arched.

It is with the low-tension make-and-break ignition, however, that much of the interest in the Studebaker motor lies. This ignition is best illustrated in the diagramatic representation of one of the igniter plugs, together with the different driving members as seen directly above. In this, I is the bus-bar, which forms a part of the circuit from the magneto, the current from it being conducted by the wire J to the stationary plug of the make-and-break mechanism. H represents the one wire connecting from the magneto to the bus-bar. In understanding how the spark takes place in this make-and-break, the reader should note the rocking electrode C

with its arm C1 within the cylinder, this arm having a contact point adapted to rest against or strike upon the contact C3 of the stationary electrode. In making the spark the arm C1 is first pressed against the contact C3, thereby completing the electric circuit from the bar J, through the point C3, the arm C1 and thence by ground connection back to the magneto. But before the spark takes place arm C1 must be pulled away from contact C3, which is done by the spring C2, and as the arm leaves the point C3 the current in its effort to continue flowing bridges the gap between them and forms the spark. This spark only continues while the gap is narrow and ceases before C1 takes its position, as illustrated. The problem of moving the arm C1 against the contact C3 is accomplished by a push-arm B, carried on an eccentric on the end of shaft A driven from the motor camshaft and adapted to strike against the spur C4 on the rocking electrode C. As A revolves, its eccentric action transmitted through the push-arm B forces the spur C4 ahead of it, bringing the arm C1 back against the contact C3, and by the time it reaches the contact C3 the arm B slips off the spur C4, allowing the spring C2 to quickly pull the arm C1 away, thereby breaking the circuit and making the spark. The timing of this ignition is accomplished in an ingenious manner by means of the arm D1 and the roller D, against which roller bears the push-arm B. The other end of the rod B1 carries a roller D2, acting in spiral slot in E, and arrangements are such that, by partly rotating the quadrant G which meshes with a bevel pinion F, E is rotated, thereby varying the location of the roller D with reference to the push-arm B, so that it allows the arm B to strike on the spur C4 anywhere between the tip and the curved inner part. Should it strike on the tip, then the arm C1 strikes the contact C3 quicker than if B pushed against the inner edge of the spur C4, thereby giving an earlier spark.

The Simms-Bosch magneto used to generate current for this system is conveniently placed at the right front where it interferes but slightly with the removal of the intake valve springs and is gear-driven, being attached by the usual metal strap encircling the magnets and having a jaw coupling in its driveshaft. It is geared to revolve at the same speed as the crankshaft and generates a current of practically 110 volts, which is sufficient for the make-and-break system.

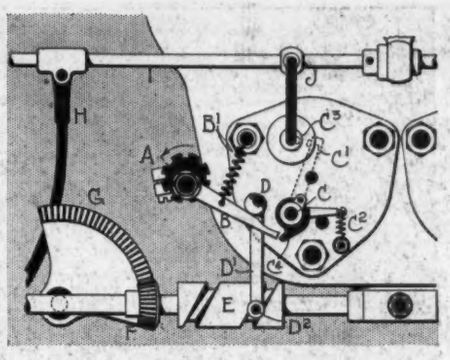
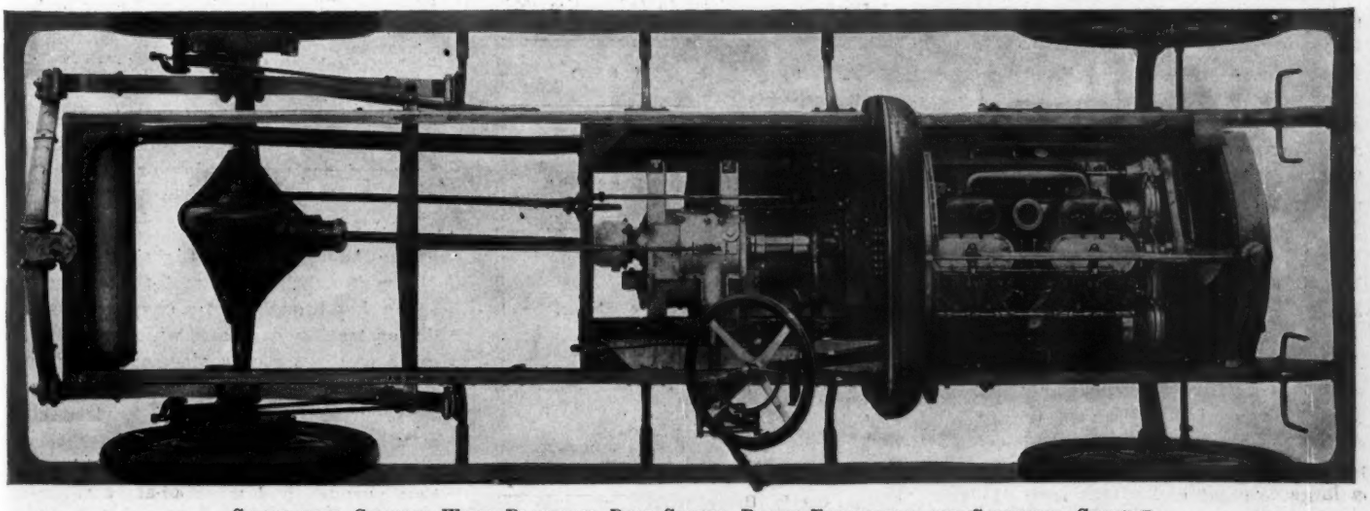


DIAGRAM OF STUDEBAKER MAKE-AND-BREAK IGNITION SCHEME

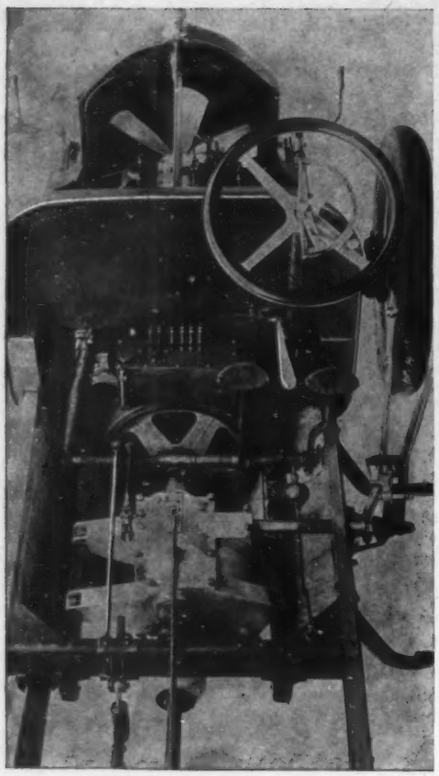
Although the transmission system has been improved by the adoption of the selective gearset, the eight-degree angle aluminum leather-faced cone clutch remains, its merit consisting in the adoption of cork inserts with fourteen gradual engagement springs carried under the leather facing at the small end of the cone; the springs tending to eliminate any quick jerk consequent upon sudden dropping in of the clutch. Between the clutch and gearset is a double universally jointed telescoping shaft, with two-threaded dust-excluding sleeves, one at each end of the shaft which can be unpinned, making it possible to telescope this universal shaft in itself and allow its removal, as well as that of the clutch. By this construction the clutch spring and the universals are entirely enclosed, yet the accessibility of the parts is not impaired. The selective gearset employs gears made of 50 carbon steel with 5 diameter pitch and 1-inch face; and main and countershafts carried on F and S annular ball bearings of ¾ and ½-inch diameter respectively. The set follows that design in which the countershaft is directly above the mainshaft. The aluminum casting enclosing the set being a two-piece affair with the ends bored to take the bearings for the countershaft and the top carrying a large inspection plate which when removed allows of the ready removal of the gear-shifting rods, all of which are entirely encased and operate in oil. The round mainshaft carries four $\frac{5}{16}$-inch feathers distributed at 90 degrees and each secured by four riveted-through pins. All gears are locked in position whether working or idle; and reverse is obtained not by sliding an intermediate pinion, but by mounting this pinion in a forked arm, which is rocked one way or the other to disengage or engage respectively with the countershaft and mainshaft gears. Speed changes are all effected by a side lever working in a three-slot quadrant with entrance to the reverse slot only through the use of the spring latch in the lever.

The propellershaft, a one-piece 50-point carbon steel forging carries front and rear universal joints; the rear joint being trunnions with square joints as employed on the short shaft between the clutch and transmission; whereas the forward point is a two-cross affair.

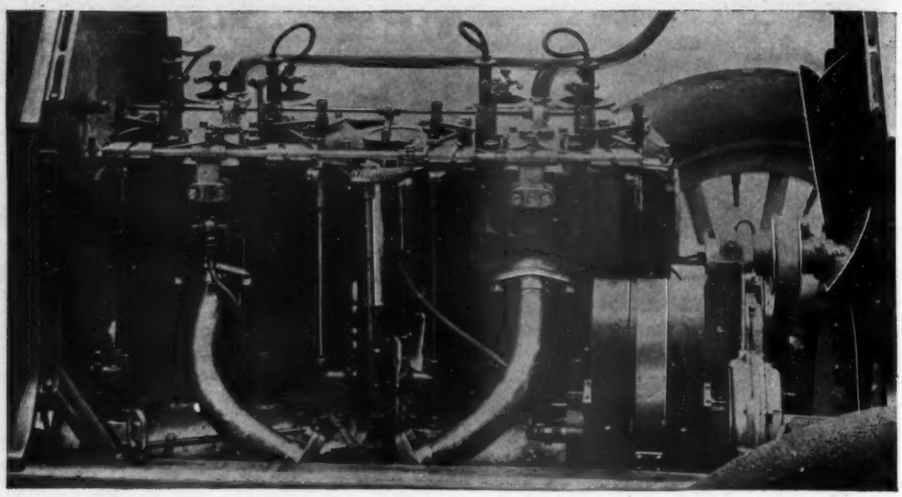
On the rear axle selection of material as well as design and careful manufacture has been looked to. The pinionshaft carrying the pinion A, which is illustrated on another page, is a 50 carbon steel member 1¾ inch in diameter and carried between two F and S annular bearings B and B1, with no separate thrust bearings. The axle driveshaft, made of Sanderson's tool steel 1¼-inch diameter, are squared to $1\frac{7}{16}$ inch at their inner ends, where they take the differential bevels with the squares hardened and finished by grinding to fit; and carry on their other ends the hardened wheel driving clutches, common in floating rear axle construction. The balance or differential gears are hardened steel, the gears of twenty-eight teeth and the pinions fifteen, all carried on two-point



STUDEBAKER CHASSIS WITH PLATFORM REAR SPRING, BRAKE EQUALIZERS AND SELECTIVE GEARSET



STUDEBAKER SELECTIVE GEARSET



INTAKE SIDE OF STUDEBAKER MOTOR WITH MAGNETO IN PLACE

ball bearings. No seperate thrust bearings are fitted in the entire rear axle assembling. The bevel gear housing is of malleable iron casting with aluminum cover sufficiently large to permit the disassembling of the set; the axle tubes are braced and pinned to the differential housing. The solid jaw clutches on the ends of the axle driveshafts are cut with five teeth, $\frac{3}{16}$-inch deep and $\frac{7}{8}$-inch face, and the co-acting clutch member is integral with the malleable iron hub. In order to make the fit of the co-acting parts as perfect as possible, the hardened clutch teeth are oil-stoned by hand. Assisting the rear axle in its driving and intended to remove the strain from the platform spring, is a channel-section torsion arm, secured at its forward end between upper and lower springs, and at its rear anchored to the differential housing. Further assisting in this work is a pair of strut rods made from 1⅝-inch steel tubing, with 5-32-inch wall. These rods have steel vertical flat joint ends pinned and brazed at the rear, and the forward ends take a ball ending with thread shank, which is carried in a cupped bracket riveted to the chassis frame.

The forward axle is an I section forging, with Elliott ends for the steering knuckles, and the front wheels are carried on double ball races of the two-point type. All springs are coned, grooved and banded and made from leaves 2¼ inches wide. The front semi-elliptics rest with their centers on the axle seating, whereas the rear side springs are mounted 3 inches off center, the short end of the rear. In the rear platform spring use is made of the universal shackle between the cross and side members, which permits of a free movement of the spring members up and down, but prevents side sway of the car.

Among the other running-gear parts may be noted the conventional pressed steel framework, with use made of subframe member for carrying the motor and gearset. All gusset places are formed integrally with the cross members, and the entire frame assemblage is done at the factory, the pressed steel parts only being supplied by the frame maker. Steering is through a gear composed of a triple square thread, working on which is a nut with an integral rack and meshing with this rack is a 22-tooth pinion, which carries the radius arm, or rock arm, with its globe end. On the steering wheel are the ratchet-retained throttle and the spark levers. The remaining control parts are the two-hand levers, the outer one being pushed forward for applying the internal emergency brakes and the inner one working in the three-slot quadrant for the speed variations; two pedals are needed, the right for the external brakes, the left for the clutch, and in addition is an accelerator pedal adapted to be worked without disturbing the throttle control on the steering wheel and which when such is released the throttle takes the adjustment determined by the control on the steering wheel. The car has fitted a straight-line body with low backs to front seat and tonneau back not too high. The plain bonnet conforms to the radiator shape and is well suited to the concave metal dash. The rear fenders are semi-circles, following the tire contur.

STUDEBAKER H AND A

Horsepower—30
Cylinder diameter—4⅛ inches
Piston stroke—5¼ inches
Ignition—Low-tension make-and-break
Magneto—Simms-Bosch
Clutch—Leather-faced cone
Transmission—Sliding gear progressive
Number of speeds—Three forward
Drive—Cardan shaft
Wheel base—104 inches
Tires—34x4 inches
Brakes—Internal on rear wheels, band on transmission
Springs Model H—Semi-elliptics in rear
Springs Model A—Platform in rear
Rear axle—Floating and ball bearing
Front axle—I-beam forging
Wheel bearings—Ball
Lubrication—Mechanical oiler
Gasoline capacity—15 gallons
Steering—Worm, nut, rack and sector
Passenger accommodation—Five

SPECIFICATIONS OF TWO MODELS

MANUFACTURERS' MISCELLANY

The K-W Ignition Co., Cleveland, O., has improved its friction-driven 1908 magneto by using a friction wheel with a face width double that employed last year, and in which is a number of rings of chrome, tanned oilproof leather which is claimed to increase the friction and make the drive more positive. Motor Age readers will recall that this magneto is one, in fact, the only, alternating current magneto which is not gear-driven. It is intended to serve as a source of current to take the place of a battery, and operates in connection with a spark coil and timer as used in any battery system. Its claimed value as a current producer is that it produces the sine wave current, an alternating flow that is steady and uniform. The winding remains stationary while the magneto is in operation, the only revolving part being the rotor, which is made of laminated iron and runs on ball bearings.

R. A. Robbel, Chicago, Ill., is marketing a high-pressure packing claimed to be capable of withstanding high steam pressures as well as temperatures and to be proof against burning or cutting the rods. It is put up in rings of different sizes ready for use.

The Avery Portable Lighting company, Milwaukee, Wis., maker of the Avery gas tanks, has brought out a sign suitable for demonstrating cars and which shows the name of the car on a glass ground with a light in rear consisting of two small acetylene burners for illumination. The sign may be attached to the sides, back or radiator of the car by screws provided for that purpose, and when used in the rear replaces the tail lamp. The front of the

sign is stained glass, white lettering, with a red ground, the letters being 2 inches high. In addition to the name of the car, the license number can be used. The acetylene is taken from the regular acetylene lead to the gas lamps.

MOTOR CAR LITERATURE

"White Route Book No. 6," issued by the touring bureau of the White company, covers a route from Philadelphia over the national highway as far west as Springfield, O., thence southward through the southern states to Savannah, Ga. Besides giving road directions for more than 1,800 miles, articles and illustrations descriptive of the route are included. The routes are numbered consecutively forty-one to fifty-four and are divided into sections as follows: Philadelphia to Harrisburg, Harrisburg to Gettysburg, Hagerstown to Cumberland, Cumberland to Wheeling, Wheeling to Columbus, Columbus to Cincinnati, Cincinnati to Lexington, Lexington to Louisville, Louisville to Mammoth Cave, Mammoth Cave to Nashville, Nashville to Chattanooga, Chattanooga to Atlanta, Atlanta to Macon and Macon to Savannah. In the first thirteen pages of the book is found a general story covering touring over the route, with typical country illustrations interspersed. In another section of the book are twelve other descriptive pages dealing with the trip from Nashville to Savannah, with illustrations.

"Irwin's Illinois Automobile Routes for 1907," compiled by Samuel P. Irwin, Bloomington, Ill., is a seventy-five-page leather-covered booklet, covering 125 or more routes in Illinois and Wisconsin. A separate map is used to illustrate each route. In these route descriptions, the mileage of each route is not given at each turn or road-mark, but the total mileage of the route given at the start.

"The Rubber Trade Directory for 1908," issued by the India Rubber World, is a 250-page directory giving the name and address as well as the officers, directors and committees of the different rubber organizations throughout the country, followed by a directory of the different rubber concerns, classified under states and subdivided under cities. Supplementing this is a copy of the American trademark law, several pages on key letters of company's name, a copy of the law of the states relating to foreign corporations, and statistics concerning the rubber industry.

STUDEBAKER MODEL B

Horsepower—40
Cylinder bore—4¾ inches
Piston stroke—5¼ inches
Ignition—Make-and-break
Lubrication—Mechanical oiler
Clutch—Leather-faced cone
Transmission—Selective
Speeds—Four forward
Wheel base—114 inches
Tires—34x4½ inches
Brakes—Internal and external rear wheel drums
Rear axle—Floating, ball bearing
Gasoline capacity—20 gallons
Front axle—I-beam forging
Springs—Rear platform
Body—Seven-passenger
Steering gear—Worm, nut, rack and sector

SPECIFICATIONS OF STUDEBAKER B

The 1908 Matheson catalog makes use of some excellent assembly illustrations, among which are gearset, jackshaft, steering knuckles, brakes, etc. The catalog is one of a few in which voluminous introductions are eliminated and only descriptive matter used.

Illustrated for the first time in a Haynes catalogue is the ratchet gear used on the forward end of the countershaft of the transmission set, by means of which it is possible to let the car overrun the engine descending a hill without releasing the clutch.

An attractive cover effect on the 1908 Jackson catalogue is the embossing of the head of President Jackson and surrounding the same with a laurel-wreath in gilt, above which, embossed in gold, is the word "Jackson." Two opening illustrations are used, one of the factory, the other two-color rural scene with car in the foreground.

No attempt is made at decoration in the '08 American catalogue, other than large reproductions of car parts; the reading matter is confined solely to car descriptions. The Premier catalogue illustrates and gives specifications of its five models on the five opening pages of its catalogue, and devotes the rest of it to a very detailed description of the cars.

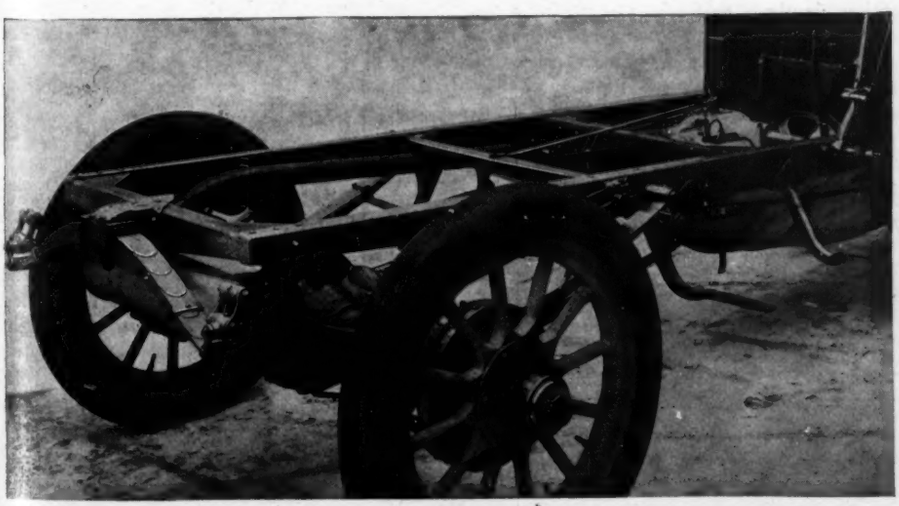
Out of the ordinary in the 1908 literature of the Thomas-Detroit cars is the reproduction of letters from users of these cars; in all, eight pages being so made use of. The remainder of the catalogue is devoted to brief descriptive paragraphs.

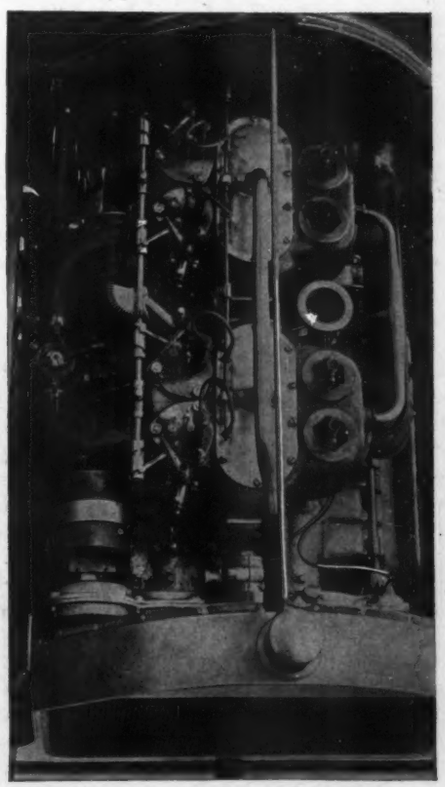
Under the title "Technical Opinions of the Foremost Critics of America," the Matheson Motor Car Co. has published extracts from the technical press of America and England, which deal with certain phases of motor car construction, and beneath each extract publishes a paragraph showing how Matheson construction agrees or takes issue with such. The style is decidedly unique, having been seen used about once before.

The United States Official Postal Guide for March contains notices of registry changes, as well as the usual list of new postoffices.

Lozier Logic for March illustrates the Plattsburg-New York shops of the company and contains several stories on Lozier midwinter performances.

The Cleveland-Canton Spring Co. has a book which illustrates the many styles of springs manufactured, and contains two descriptive pages on the material and manufacture of their springs.





STUDEBAKER PLATFORM SPRING WITH UNIVERSAL SHACKLE AND TOP OF MOTOR, SHOWING IGNITION PARTS

AMONG THE MAKERS AND DEALERS

PACKARD PLANT AT DETROIT, SHOWING BIG FORCE OF WORKMEN NOW EMPLOYED BUILDING CARS

Matheson in Chicago—The Bird-Sykes Co. has taken the agency for the Matheson for Chicago and vicinity. The company also handles the Corbin.

Handling Auto Meters—J. A. Barclay, of Indianapolis, has been appointed Indiana agent for the Warner Autometer Co., of Beloit, Wis. He will maintain headquarters in Indianapolis, which were opened in time for the show last week.

Mason Company Reorganized—Complete reorganization of the Mason Motor Car Co., with a doubled capital stock and twice the capacity, is announced by E. R. Mason, owner of the concern. The capital stock has been increased from $50,000 to $100,000, and the capacity of the factory will be doubled. Twenty-five additional men will be put on at once. There are now fifty men working.

D. A. D. A. Holds Election—At the annual meeting of the Detroit Auto Dealers' Association it was decided to hold a 3-day endurance run through Michigan, planned after the Glidden tour. Hill-climbs, amateur race meets and economy tests are among the possibilities. Last year's officers were re-elected as follows: President, A. I. McLeod; vice-president, J. P. Schneider; treasurer, J. H. Brady; secretary, George E. Lane. The board of directors consists of the officers, with Charles Grant added.

Finishing Output Early—In accordance with its long-established custom of making early deliveries of its product, the Packard Motor Car Co., of Detroit, is busy to the full capacity of its plant, getting out the last 400 cars of its season's output. Already 1,000 1908 Packard Thirties have been delivered to purchasers, and the 2,000 men at work in the different departments of the factory, which covers a floor space of 11 acres, are now turning out cars at a rate which will probably complete the annual program of production on schedule time. Last season the final car was finished a month ahead of the scheduled time of delivery, and the company is anxious to be well advanced at the close of this season. The company's new power plant is now in operation, giving a total of 2,500 horsepower.

On the Outskirts—Jacob F. Baumann has opened up the Club garage at Catonsville, Md., a suburb of Baltimore. He is agent for the Postal, Pullman, Jackson and Ford cars in the flourishing little town.

Memphis Organizes—The dealers of Memphis have formed an association and elected Jerome P. Parker president and William Bruce secretary. It has completed arrangements for a show April 16, 17 and 18. The building contains 30,000 square feet on one floor and without a post.

Change of Address—Owing to the growing demand for its product, the necessity of being located at a better distributing point became so apparent that the Slama Tire Protector Co. has removed its general offices from Humboldt, Neb., to 609 East Fifteenth street, Kansas City, Mo., where all correspondence should hereafter be directed. The factory, however, will remain at Humboldt, Neb., as heretofore.

Improving Engine Plant—The Continental Motor Mfg. Co., of Muskegon, Mich., is about to begin erection of a new machine shop, the dimensions of which will be 110 by 175 feet. Contracts will be let immediately and the building will be ready June 1. The building will be of one-story construction, fireproof and with saw-tooth roof construction. The company intends to place all its present machine shop equipment in the new building, and also is making extensive additions and increasing its machine tool equipment. A large motor-testing house with a capacity for testing fifty finished motors at one time has been completed. The proposed improvement is the fourth addition to the plant since locating in Muskegon less than 2 years ago. The Continental line now comprises engines for motor cars, taxicabs, motor trucks, marine motors. Also the company has sold a great many motors during the past year for various industrial applications, including lawn mowers, electrical lighting plants, tile-laying and ditching machines and heavy gang plows.

Builds New Garage—Samuel Osmundson, of Willmar, Minn., agent for the Buick, Rambler and Cadillac, has moved into a new garage. It is 50 by 75 feet, one story in height, and of solid brick, with a half basement.

Now Bosch Magneto Co.—The Bosch magneto has been marketed for years under the firm name of Robert Bosch, New York, but with the idea of emphasizing more clearly the name of the magneto the manufacturers will hereafter be known as the Bosch Magneto Co.

Selling Second-Hands—B. F. Blaney and S. A. Campbell, formerly connected with the Corbin agency in Boston, have formed a company to handle high-grade second-hand cars in that city. They were with the company some years and were quite successful. When George T. Dunham took the agency the old force was let go. Mr. Blaney then identified himself with the Selden car, for which he became sales manager, and has been in Rochester, N. Y., for some time. While he was here at the Boston show he opened up the Selden agency for H. D. Castle, of the Lozier. Mr. Blaney will remain with the Selden people, at least for the present.

Columbia Affairs—Slowly but surely the clouds which for the past 3 months have enveloped the plant of the Electric Vehicle Co. at Hartford, Conn., are beginning to make way for blue sky. At no time since the receivership have things looked more promising. Orders have been filed for about sixty of the 30-horsepower light gasoline cars since the works resumed 2 weeks ago. The shops apparently will be kept going on these Columbias alone for some time to come. The number of men employed has been gradually increased so that at present there are about 225 men at work. If the rumored Packard deal is closed in all probability the Columbia gas

cars will not be made in Hartford, and it is stated that negotiations are now in progress for the manufacture of these machines elsewhere.

New Salesrooms Opened—The new salesrooms of the Motor Car Co., of Baltimore, of which Howard W. Gill is president, have just been opened to the public. The new salesrooms are said to be the most spacious in the south.

Puts in Tire Repair Plant—The Auto Tire Co. has removed to its new store at 603-607 East Fifteenth street, Kansas City, Mo., where a fully-equipped tire repair plant has been put in, which is equipped with the latest types of vulcanizers and repair machinery. Victor Nelson is the proprietor, and the concern also carries a full line of Morgan & Wright tires, for which it is general agent.

Building New Factory—The Electrical Construction Co. at Racine, Wis., has started the erection of a three-story factory and garage, the work on which is now being pushed. The garage will be located on the first floor and the motor car shops will be on the second and third stories. The building is of brick construction. Electricity is to be used by the company as machine power.

Wants to Buy Cars—"That there are not yet enough types of cars, particularly commercial vehicles, on the market, is every day more evident," said Harry Levey, of New York. "I am in the market for thirty-two light gasoline delivery cars capable of a carrying capacity of 54 cubic feet, but of not necessarily more than 200 pounds besides the driver. The ideal car for my purpose would be a runabout of the buckboard type, costing about $300, and I could place as many more among business connections. I do not know of anything now built which fills these requirements, yet the thing is so simple that I could build it myself. I may yet do so, as I am offered a large interest in an excellent little factory at a most tempting figure."

Pittsburg Show Prospects—Nearly seventy makes of cars are assured for display at the show to be held in Duquesne garden, Pittsburg, April 4-11. These will be ranged around 700 yards of balustrade on the first floor. The American military band of forty pieces was secured last week for the entire show, which makes the musical feature one of the big attractions. The Gabriel musical exhibit will be another of the unique features of the entertainment promised. Entries are coming in rapidly from accessory dealers, and very little space will be left at the end of this week. The Oakmont Motor Boat Co. will have a large exhibit, and two or more makers of commercial vehicles will be well shown up with good 1908 models on exhibition. General interest in the show is much greater than last year, and dealers in Greater Pittsburg and vicinity expect it will pay them well in an advertising way for the large amount of time and labor which they are spending to make the show much more of a success than it was last year.

Adds the Jackson—The Shaffer Mfg. Co., 408 and 410 North Calvert street, Baltimore, Md., now is the Maryland representative of the Jackson. The company has been the Baltimore agent for the Pullman for some time.

Has Mitchell in Baltimore—The Mitchell is being handled in Baltimore this year by W. P. Shuler. He has his garage and salesrooms at 1002 Morton street, where he has been located for several years as agent in the Monumental city for various cars.

New Garages in Wisconsin—A garage has been fitted out at Ripon, Wis., by T. G. Marshall. This is the first motor establishment for Ripon. For some time there has been need for such a place, as the number of machines in the city has rapidly been increasing. A garage has been opened at Rice Lake, Wis., in the shop of T. H. Field, the Ford representative at that place, and O. C. Baumann, of Madison, Wis., is in active charge. The Haines Motor Co. has just been incorporated and will be located in Milwaukee.

Orders for Trucks—The Indianapolis Motor Car Co., Indiana agent for the Rapid line of trucks, has received an order from Cuba and one from Gaffrey, S. C. The order from Cuba was written in Spanish and was from Rafael Domenech, Santo Domingo. It was addressed to "Mr. Indianapolis Motor Car Co., New Phone 3680, Eu de A." The South Carolina order was from the Irene mills, and is to be used in hauling flour, while the Cuban order was for a twelve-passenger bus, to be used in hauling passengers from the docks and for sight-seeing purposes.

First Newcastle Maxwell—An incident, small in itself, but which marks an epoch in the development of the motor industry, was the shipment of the first complete car from the new plant of the Maxwell-Briscoe Motor Co. at Newcastle, Ind., last week. This plant, which covers 8 acres of ground, is one of the most modern in construction and highly specialized as to tool equipment in the world, and it is capable of turning out finished cars, every part of which—except tires—has been made on the ground. While several hundred cars have been assembled at the Newcastle plant since its erection, only certain parts had been made there, the other parts having been turned out of the three other Maxwell plants, at Tarrytown, Pawtucket and Chicago. From now on each plant will devote itself exclusively to the manufacture of one model, and that in its entirety—the light runabout model at Pawtucket, R. I.; the four-cylinder 28-horsepower touring car at Tarrytown, and at Newcastle will be made the two-cylinder model H roadster and touring car. This will enable each plant to work to better advantage, and will effect a very considerable economy in time and money heretofore lost in the transportation of parts between the different factories.

Building Concrete Place—Wuld Brothers, of Milwaukee, have begun the erection of a large concrete block repair shop, to be located on National avenue, between Second and Third avenues. The new shop will be completed by the active opening of the season.

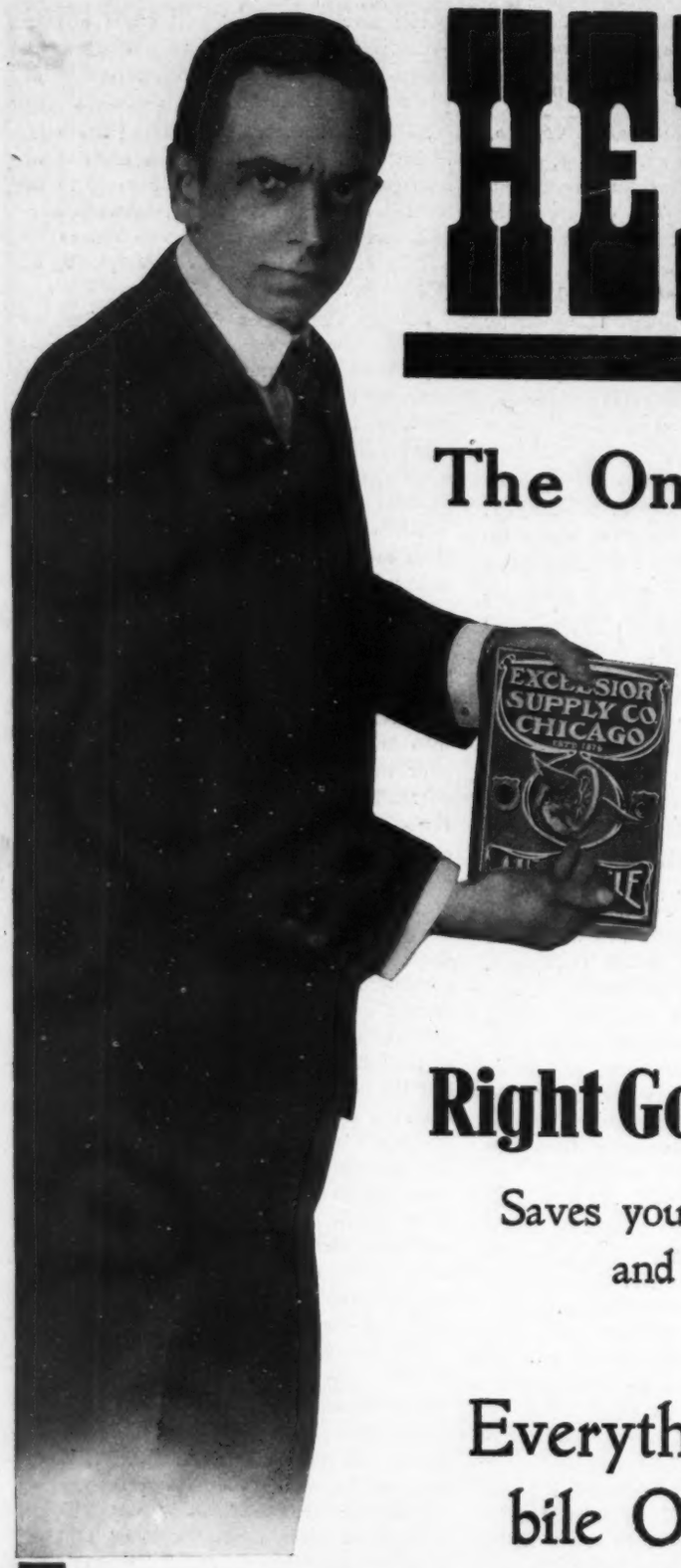
Soldier Invents a Tire—The Gesford Punctureless Tire Co. has been incorporated under the laws of Washington for $500,000 by Judge F. Van Norman, L. L. Park and Charles Holt, of Spokane, to manufacture motor car and bicycle tires after patterns designed by P. G. Gesford, a veteran of the civil war now in the Soldiers' home at Orting, Wash. The tires are to be built in sections, so any wornout parts can be easily replaced.

Report Good Business—Cleveland dealers report that trade is opening up in most satisfactory shape. As the season progresses the prospects for a good year grow brighter. Still, there are many people who are holding up their orders, looking over the field thoroughly and hoping to obtain better prices by waiting. The fight for sales is keener than ever before. There are more agencies than in former years and quite naturally they are fighting harder for the business.

Finding Out—Manager Thomas F. Anderson, of the Boston publicity bureau, a municipal department formed to attract to Boston various enterprises, has started to find out why it is that Boston has no big motor car manufacturing plants. At the last Boston show out of all the cars shown not one, with the exception of a steamer, was made in Boston. The one exception is not extensively manufactured, so that there are practically no cars made in the Hub. With all the facilities at hand it does seem strange. Mr. Anderson has sent out a letter to a large number of motorists and business men and he intends to personally interview others to see if he cannot awaken capitalists to get busy building cars there.

New Marmon Agents—The 1908 agents of the Nordyke & Marmon Co., Indianapolis, will be as follows: F. E. Wing Motor Car Co., 12 Columbus avenue, Boston, Mass.; Brazier Auto Works, Thirty-eighth and Market streets, Philadelphia; Snodeal Automobile Co., 2552 Madison avenue, Baltimore, Md.; H. T. Hearsey Vehicle Co., 113 West Market street, Indianapolis; Pennsylvania Auto Co., Hay street and Knight avenue, Wilkinsburg, Pittsburg; C. S. Anthony, 110 East Ninth street, Los Angeles, Cal.; Van Automobile Co., 1706 Washington avenue, St. Louis, Mo.; Waterloo Automobile Co., Waterloo, N. Y.; Heller-Spawn Motor Car Co., Binghamton, N. Y.; John Ure, Jr., & Co., Milwaukee, Wis., and Rickey Machine Co., 92 Eaton place, East Orange, N. J.

HERE IT IS



The One Book You Need

Catalogue No. M 108

Just Ripe From the Press

Right Goods at Right Prices

Saves you Money, Motoring Necessities and Comforts at Low Cost.

Everything for the Automobile Owners and Dealers

Excelsior Supply Company

Established 1876

233-235-237 Randolph Street :: :: :: CHICAGO